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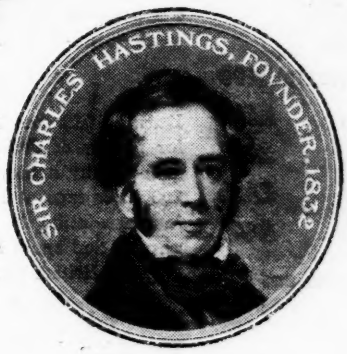

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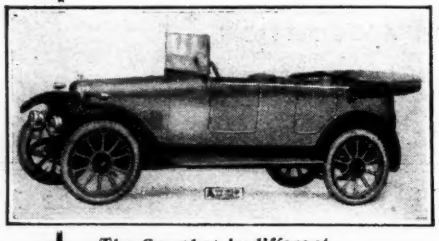

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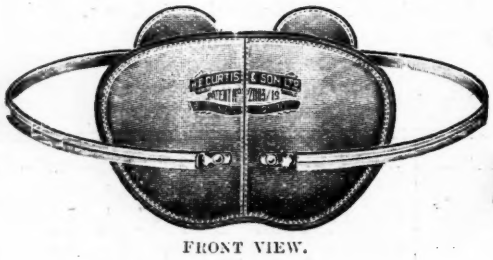

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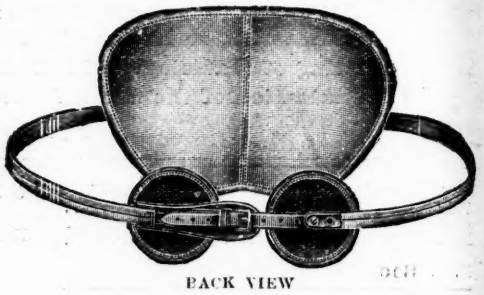

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SECTION OF SURGERY.

Professor H. ALEXIS THOMSON, C.M.G., M.D.Edin., F.R.C.S., President.

DISCUSSION ON THE DIAGNOSIS AND TREATMENT OF CHOLELITHIASIS.

OPENING PAPERS.

I.—RUTHERFORD MORISON, F.R.C.S.,

Emeritus Professor of Surgery, University of Durham.

DURING the last twenty-five years there has been an enormous output of literature on the subject of cholelithiasis and its treatment. My interest in the subject extends back more than thirty years, and my first paper bearing on it was published in the BRITISH MEDICAL JOURNAL in 1894. The title of it was "The anatomy of the right hypochondrium relating especially to operations for gall stones." The fashionable operation of that time was done through a *vertical* incision in the linea semilunaris sufficiently large to admit two fingers; the operation I advocated was to be carried out through a transverse incision of sufficient size to enable the whole field of operation to be fully and easily explored. This and other papers can be found in vol. ii of *Surgical Contributions*, and the page references throughout are to this book of mine.

My next paper complementary to this was published in the *Annals of Surgery* for August, 1895 (p. 141 et seq.), and it has been with some dismay that I have discovered on rereading it how small are the additions I have been able to make since to my knowledge of the subject. I will first quote the conclusions arrived at then, omitting the notes of the cases upon which they were based. Further conclusions extracted from papers which followed, along with a short note of any additional information I have since acquired, will provide a complete history of my beliefs concerning gall stones up to date.

There are still many questions unsettled and unsolved, so that discussion should be useful if each one taking part in it contributes something from his own experience.

1895.

My 1895 conclusions were as follows (p. 141):

"Gall stones are formed in the great majority of cases in the gall bladder. Mucus seems to be essential to their formation, and this is only secreted by the gall bladder and larger ducts. The circulation in the larger ducts is so constant that deposition of salts and inspissation of bile would be difficult there, but in the gall bladder the relative stagnation and other conditions are favourable to gall-stone formation. Though gall stones are not infrequently found in the smaller bile ducts, it does not follow that they are formed there. It is not difficult to believe that they are carried and deposited by a back-flow of bile, which must be a common occurrence in the complicated biliary circulation."

"My belief is that the pain of gall-stone attacks is due to the presence of a stone and cholecystitis. Neither stone alone nor distension alone causes contractions of the gall bladder, which are the cause of the painful attacks."

Diagnosis.

"Painful spasms" commencing in the epigastrium are the earliest symptom of gall stone. These are due to forcible contractions of unstriped muscle, probably stimulated by cholecystitis. A stone small enough to obstruct partially the cystic duct causes some distension of the gall bladder, which can be palpated, and the disturbance intermits.

"When the gall bladder is distended without jaundice, and pain after the first acute attack is absent, a stone has completely blocked the mouth of the gall bladder or the cystic duct. Such a gall bladder can continue as a painless swelling for weeks or years if its mucous membrane does not become infected."

"Attacks of severe pain in the epigastrium and right hypochondrium, accompanied by vomiting and shivering and followed by sweating, complete relief, and transient jaundice, are due to the passage of a gall stone from the gall bladder through the ducts into the duodenum."

"If relief after the pain is incomplete, the jaundice more or less persistent, and the patient every now and again attacked by ague-like paroxysms, generally with, or perhaps without, pain, each attack being followed by a temporary increase of jaundice, a stone is impacted in, but not completely blocking, the common duct. Operation in these cases shows a much dilated common duct and a small contracted gall bladder. The dilatation of the duct is what surgeons who know of the behaviour of all muscular ducts with foreign bodies in them would expect. At first the intruder is firmly gripped, but shortly dilatation commences, and the walls of the tube tend to recede more and more from it. The gall bladder in the early stages can be felt enlarged and tender; in the later stages the local signs are tenderness and enlargement of the liver, for then the gall bladder is shrunken and thick-walled, and generally buried in adhesions. Like the urinary bladder the gall bladder will become contracted and hypertrophied when dealing with a partial obstruction, and, like it, will dilate painlessly when its efforts to overcome the obstruction are futile."

Treatment.

Gall stones are a serious possession, and only operative measures are of any real use. The diagnosis of gall stones should consequently mean the recommendation of an operation, because this is safer than expectancy; recovery after operation is expeditious and complete in cases uncomplicated by delay, and the suffering of patients operated upon is incomparably less.

The operation advocated by me opens up by a transverse incision extending from over the rectus muscle in front to the loin behind, midway between the costal margin above and the iliac crest below, the pouch I described in 1894. This gives free access, allows of the best drainage, and is seldom followed by hernia.

1. When the gall bladder is not contracted (after removing all stones) the opening in it should be closed by sutures and the viscus returned to the abdominal cavity with drainage of the pouch.
2. When the gall bladder is shrunken it may be returned unclosed.
3. When a stone is impacted in the cystic duct and evades all ordinary efforts to remove it, the gall bladder should be excised and the cystic duct ligatured.
4. When a stone is impacted in the common duct, the duct should be incised, and after the stone or stones are removed the opening may be left unclosed if there is any difficulty in applying a satisfactory suture, as drainage of the hepatic pouch behind will suffice.
5. When a stone is impacted in the common duct, it depends upon what part of the duct it is lodged in, whether finding it during the operation is difficult or easy, and its removal safe or complicated. The stone may be lodged above that portion of the duct which comes into relation with the head of the pancreas, when it can be grasped and removed by a direct incision, after exposure of the portion of duct in which it is lying, the separation of (often troublesome) adhesions being the chief difficulty; or it may be lodged in the ampulla of Vater, where it is entirely covered up by the head of the pancreas, and interferes with the flow from the pancreatic duct. Inability to feel the stone and the induration of the head of the pancreas in such a case may lead the operator to believe that he is dealing with a pancreatic tumour. If, after opening the duct, a stone cannot be removed through the ordinary incision, it should be taken out through the duodenum, as recently advised by McBurney.
6. The gall bladder should never be sutured to the parietes.
7. If the usual operations are followed by the fresh formation of gall stones, resection of the gall bladder must be the rule.

1897.

In 1897 (p. 241) I drew special attention to cases in which a painless gall-bladder tumour and painless jaundice might mislead if the early history of pain had been forgotten, and also recorded a case of sacculus of the gall bladder, pointing out the possibility of rupture into the peritoneum, which I believed was a not uncommon event in gall-stone cases.

1898.

In 1898 (pp. 289–299) the importance of a gall-bladder tumour and its differential diagnosis was pointed out.

"Proof that gall-stone pain is due to contractions of the gall bladder is found in the facts that prolonged distension of

it produces no pain; that the closure of a fistula, if the obstruction be not removed, is followed by pain immediately relieved by discharge from the fistula, and that the injection of such a fistula with fluid distending the gall bladder produces characteristic gall-stone pain, just as tension from injection of the kidney pelvis produces renal colic.

"After an attack the bowel excreta should be carefully searched and if stones are found this is an encouragement to wait, but even then the wait must not be prolonged. If no stones are found, and the attacks are repeated, it is probable that a stone is impacted, and the sooner it is removed the better.

"In jaundiced cases the discovery of adhesions, which often point to old ruptures of the gall bladder, during the operation is of considerable diagnostic value and important because they are an encouragement to continue a search for stones."

1903.

In 1903 (p. 491) is a record of cases dying after operation, showing that the mortality chiefly depended upon delay resulting in the pathological changes which had occurred in the liver and ducts—hepatitis, cirrhosis, and cholangitis.

1905.

In 1905 (p. 652–671) "that serious results are scarcely at all due to the hundred more or less stones in the gall bladder but to one or more driven into the ducts" is emphasized.

That complete obstruction, with an active inflammation superadded, resulted in tension gangrene—that is, gangrene commencing at a spot most remote from the source of the vascular supply, such as could occur in every hollow viscus.

That sacculi were common to all of these hollow muscular viscera.

That pancreatitis in some cases so closely simulates gall-stone attacks as to make diagnosis impossible. In many of these cases the intermission of the pains and jaundice can only be explained by the view that a temporary increase of the pancreatic swelling causes for a time obstruction of the common duct, and this explains the fact, which I have not seen previously noted, that the gall bladder may be thick-walled and contracted, whereas when the obstruction is complete, as in cases of pancreatic tumour, the gall bladder is thin-walled and distended and the jaundice permanent. During operation the size and condition of the gall bladder may be of considerable diagnostic value in these pancreatic cases, for it is impossible from examination of the hard enlarged nodular pancreas to say whether the infiltration is due to malignant or inflammatory deposit. A small bladder favours the diagnosis of simple, a large one that of malignant change in the pancreas.

When a single good-sized stone is present in the contracting gall bladder it may be driven into, but not impacted in, the neck and fall back when contractions cease.

If a large stone completely blocks the gall-bladder neck the attack is attended as a rule by unusually severe and long continued pain, which only gradually abates. Sooner or later after this attack the swollen, tense gall bladder will be discovered as a tumour under the right costal margin.

The case may then assume one of three types:

1. The condition is chronic, and the gall bladder is distended with clear fluid (hydrops of the gall bladder). In this case I suggest that the gall bladder had emptied itself before the stone became impacted, and that the mucus filling it and secreted by its wall, possessed, as all mucus secretions probably are, of some antiseptic quality, had destroyed any infection which might be present.
2. The distended gall bladder contains pus (empyema of the gall bladder). The diagnosis is based chiefly upon the tenderness of the tumour, which never disappears; and upon its becoming later more indefinite in outline, from omentum adhering around it.
3. In the most severe type, a few hours after the commencement of the illness, the swollen, very tender, and tense gall bladder may be felt as a hard tumour, the patient looks very ill, and acute pneumonia is a frequent complication (gangrene of the gall bladder). In these cases the gall bladder is found to be distended with highly infected, dark-coloured bile. It must have been full of this at the time impaction of the stone occurred, and I offer this explanation of the serious result.*

Jaundice and pain may both be absent and stones can be found accidentally in the common duct.

Repeated shivering attacks, *without* pain, but attended by fever and followed by jaundice, may be the only evidence of gall stones in the common duct.

*D. P. D. Wilkie's experimental results in occluded loops of intestine correspond exactly with the three conditions I had here described in the gall bladder.

Natural cure can occur at all stages of the attacks, and in the most serious cases an imitation of Nature's methods points to drainage alone, or cholecystenterostomy, as possibly the best treatment.

The danger of gall-stone operations is the result of delay and complications.

Operations for the removal of gall stones are most satisfactory when the stones are still in the gall bladder and their escape into the ducts can be prevented.

Shock, haemorrhage, and sepsis, the dangers common to all operations, are increased in jaundiced patients, and it may be impossible to remove stones from all the liver ducts, where I have not infrequently found them at *post-mortem* examination of neglected cases.

Treatment.

During the operation it is important to feel the neck of the gall bladder and the main ducts between a finger and thumb introduced into the liver pouch and the foramen of Winslow.

If the gall bladder is emptied of stones, there are none in the ducts, the cavity and walls of the gall bladder look fairly healthy and the cystic duct is patent, the gall bladder should be completely closed and returned to the abdomen with a small tube drain in the hepatic pouch. Patency of the duct is assured if, during operation, bile escapes back into the gall bladder; if not, it can be tested by pumping saline from the gall bladder into the duodenum.

If the illness is recent, and the cystic duct is obstructed by what is probably temporary swelling, or if there are signs —such as thickening, reddening, or presence of surrounding adhesions—that its walls are infected, the gall bladder should be drained.

After removing all palpable stones from the common duct it should be fully explored if possible by a finger, or with a thick metallic probe. This should be first passed upwards into the hepatic ducts, then downwards into the duodenum, to assure as far as possible that all stones have been taken away.

If stones are discovered in the hepatic ducts all that are easily accessible should be removed, but no prolonged or serious manipulation should be indulged in. Drainage must do the rest.

In the most acute cases, with gangrene of the gall bladder, after removal of the stones drain freely, with as little disturbance of the enveloping omentum as possible. Excision of the acutely infected gall bladder adds a serious risk to the operation.

In 1910 I operated upon a high-livered, short, fat, muscular man who required cholecystectomy. The physiological difficulties of performing the operation in the ordinary way were forbidding. Instead, I laid the gall bladder open from fundus to cystic duct, destroying what remained of its lining membrane with a thermo-cautery, put in a tube, and sutured the outer coats over it. He made such an easy recovery that I have since performed the operation on more than twelve occasions. All of the patients recovered, and I have heard of no recurrence in any of them.

CONCLUSIONS IN 1922.

To sum up latest conclusions I start with *Etiology*.

A great many explanations have been offered for gall-stone formation. The most universally popular has been, and perhaps still is, that they are all due to infection of the gall bladder. There is sufficient evidence against this view to condemn it. Until the cause of calculus formation everywhere in the body can be explained—and the explanation is likely to come from chemists—doubts as to the etiology of those in the gall bladder will not be dispersed. Some predisposing causes are more common than others—for example, repeated pregnancies, obesity and a sedentary life, a previous attack of typhoid fever (now a rare disease in this country); but in my experience the most common of all is that the patient is an abstainer from fluids, either by taste or prejudice, so that women and teetotalers are frequent victims.

So much depends upon knowledge of the behaviour of the gall bladder that a short note on this may be useful.

There are now doubts raised by some laboratory workers as to the possibilities of contraction of its wall, judging by their experimental research and histological examination. In my earliest cases, and often since, I have removed portions of the walls of gall bladders which contained stones and given them to a competent histologist. He found, when the walls had not been destroyed by inflammation, that the thickening was due to an increase of the muscular coat.

The smooth facets on multiple stones, and the occasional fracture of even hard stones in the gall bladder, are further evidence of the power an irritated gall bladder may exercise.

The strongest evidence is clinical, and an early experience taught me a valuable lesson.

About thirty years ago I assisted the late Professor Page with an operation on one of the older sisters in the infirmary. She had had many attacks of gall stones, and had in her possession a large collection evacuated naturally at different times. Latterly the attacks were increasing in severity and frequency to such an extent that immediately after the last one she decided to have an operation, as she had heard that this was now possible. On opening her abdomen the gall bladder was seen to be about the ordinary size, was free from adhesions, but thick and red. Neither Professor Page nor I could feel any stones, either in it or in the thickened duct, and we ventured to hope she must have passed the last one. Three days later a stone of the usual shape and size, something like a faceted horsebean, was recovered from the first faecal evacuation, and the patient had no further recurrence of her attacks during the time she was under observation—more than five years. To pass stones of this size through a duct the size of the cystic, and to impact so tightly in the neck of the gall bladder such large stones as are found there, demands some muscular activity.

No one with experience and an impartial mind can doubt that gall stones may lie for long periods without producing symptoms either in the gall bladder or, though rarely, in the common bile duct. It can also be said that certain stones are more unlikely than others to offer evidence of their presence.

There are, as in the kidney, three clinical types of stone:

1. Multiple, small.
2. Medium, a few or single.
3. Giant stones.

The multiple, small variety, from the patient's point of view, gives most trouble both in gall-bladder and kidney cases, because these stones are apt to escape into the ducts and pass through them, producing urgent temporary symptoms and repeated attacks. Medium stones, say of the size of a hazel nut, in gall bladder and kidney are apt to cause a sudden obstruction by blocking the outlet. Giant stones in either locality cause no typical symptoms, and are generally discovered when complicated by a serious infection, and, in the case of the gall bladder, by intestinal obstruction.

Diagnosis.

There is only one subjective symptom on which a diagnosis of gall stones can reasonably be based, and that is *pain*—but it must have special characteristics. It should be severe, often so sudden in onset as to be compared to a stab, lasting only a few moments in some cases (especially those with single rounded stones), in others for hours, referred to the epigastrium, catching the breath before inspiration is complete, and on its cessation leaving the patient entirely well. It often awakens the patient at night, like all colics, and is ascribed to some particular food, is frequently followed by vomiting, and is called "indigestion."

A tender area over the gall bladder on deep palpation during forced inspiration, discovered during the attack of characteristic pain, and lasting for a time after it, form the ordinary reasonable grounds for a diagnosis of gall stones, and will be correct in eight cases out of ten.

When all stones have escaped from the gall bladder into the common duct, attacks of pain, but less violent, still usually occur.

Of the signs, a gall-bladder tumour or jaundice preceded by a typical attack of pain are clinical guides that seldom fail. In my experience, in 29 of 30 cases the gall-bladder tumour is due to obstruction by a large stone; in 18 of 20 cases the pain and jaundice are due to a stone forced into the common duct.

It is likely that no great advance in diagnosis will be made till *x* rays demonstrate gall stones in the bladder and ducts as they now do in the kidney and ureter.

Treatment.

The knowledge that there is only one reasonable treatment—namely, operation—is even yet not sufficiently realized, but there is an enormous improvement in this respect, as in the results of operations, on twenty-five years ago.

Since surgeons learnt that abdominal operations cannot be performed properly with two of their fingers in the abdomen and their eyes on the ceiling many new abdominal incisions have been suggested for the removal of gall stones, and though I am not going to say that my own is the only one to be considered, or the best, I know that it is so for me. In addition to the advantages, especially drainage, already mentioned, I would add that only the eleventh intercostal nerve is divided by this incision, and that opening up a limited area, such as the pouch described, produces less disturbance than such a free exposure of the general peritoneal cavity as is necessitated by any other, if the vermiform appendix be examined, as it always should be.

Recurrence of gall-stone attacks and the external fistulae, either mucous or biliary, occurring after operations are still frequently due to stones left behind, and sometimes from insufficient exploration, which it is impossible to make efficiently through an inadequate incision.

Good results are likely to follow all careful operations for the removal of gall stones, but recurrence has followed skilful cholecystotomy, cholecystostomy, or cholecystectomy, and every experienced surgeon knows this. He does not yet know the pathology and bacteriology of gall bladders and bile ducts in which this is likely or unlikely to happen, and to settle this will require more patient research. Until this knowledge has been acquired rules for operative guidance cannot be satisfactorily laid down.

Since my earliest paper and in every later one I have advocated cholecystotomy as the best operation when the cystic duct was patulous, and this is still my conviction. In the January and February numbers of the *Annals of Surgery* and *Surgery, Gynecology, and Obstetrics*, 1922, are two papers by distinguished American surgeons, advocating the "resuscitation" of this neglected operation, so that it is possible more may be heard of it. I have never closed the abdomen entirely, but have left a small tube drain in the hepatic pouch, because many years ago a small leak occurred in one of my cases, and I prefer to take no risks.

If the gall bladder be seriously infected it should be opened freely, the stones removed, and its walls and its interior carefully inspected—unless it is so obviously pathological that recovery seems impossible it should have the benefit of the doubt. I know, from opportunities of inspecting it later, that it can recover from almost hopeless-looking conditions of disease if given a chance by removal of stones, followed by drainage through a tube maintained in position by a watertight catgut suture. If bile discharges freely from the tube it should not be kept in for more than a few days, and never for more than two weeks. The one disadvantage of this operation is that in a small percentage of cases, though every stone be removed a second operation may be required for recurrence of symptoms, but this possibility should be faced. A second operation on the abdomen shows that the first has increased the natural peritoneal immunity to such an extent as to make the consequences of the second of considerably less importance.

If the gall bladder is so much diseased that its recovery seems impossible it may be dealt with by cholecystectomy or the thermo-cautery.

My present views are against cholecystectomy as the operation of election in gall-stone cases. Just here again I want to compare the gall bladder with the urinary bladder. Every surgeon expects that after removing a stone from the urinary bladder a cystitis accompanying it is likely to disappear very soon; he also realizes how difficult it is to get rid of a cystitis without stone. I believe the same to be true of the gall bladder, and that for a calculous cholecystitis removal of the stone may suffice, but that cholecystectomy may be the operation of election for a primary cholecystitis. The dangers of the actual operation may be dismissed, as in capable and experienced hands they should not be greater than from any other gall-stone operation; my objection to it arises from physiological considerations (gall-bladder functions) and the after-results in some cases. Patients upon whom this operation has been performed may afterwards develop attacks which, they say, are similar to their old ones. After a time they become jaundiced, a difficult and dangerous operation is performed, and no gall stones are found. The common duct is thick-walled and dilated, the liver looks fibrous, and that is all the discoverable gross pathology. Further evidence will require time to collect, for in one of the cases in which, ten years earlier, I had done cholecystectomy and choledochostomy and drained the common duct, the patient was well for seven years, and not until ten years had elapsed after the first operation did she become ill enough to require a second.

It may be laid down as a general principle that the ducts of the body possess a protective mechanism which is of considerable value to the viscus with which they are connected. It is well known from experimental and clinical evidence that dilatation of the common duct follows cholecystectomy. This upsets the protective mechanism of a duct opening into a potentially septic area—the duodenum—and this cannot, I think, be done with impunity.

It is likely that a new form of hepatic cirrhosis is in course of development since the surgical craze for cholecystectomy has become widespread.

Since the beginning it has been recognized that patients with jaundice, especially when deep or prolonged, are liable to die from haemorrhage oozing, in spite of the occlusion of all visible blood vessels at the time of the operation.

If tests of the blood show that it does not coagulate in less than eight minutes means should be adopted before operation to secure this. For many years calcium preparations have been used for this purpose, but doubts are still entertained as to their efficiency. It seems probable that transfusion of blood a day or two before the operation will now receive a fair trial.

When stones have been removed from the common duct I have, during later years, drained it with a tube sutured in, though my early practice of leaving the gall-bladder and duct incisions open and draining the hepatic pouch only was successful. Acting on an American suggestion I have left an india-rubber catheter in the same duct opening and passed through into the duodenum for the introduction of fluid and nourishment in specially weak patients, with, I feel sure, considerable advantage. Drainage tubes should not be left in for more than two weeks, when efficient natural drainage should have been established. Retained tubes are more likely to increase than to decrease any existing infection.

In one very rare case I operated upon in 1903 the patient, a man of 63, had been afflicted by gall-stone attacks for five years, and on admission was very ill and slightly jaundiced. On opening his abdomen the gall bladder was found to be large, thin-walled, and much distended, and his common duct was as large as his duodenum. Both gall bladder and common duct contained several large stones and clear fluid quite unlike bile—the so-called "white bile." There was no blocking of the cystic duct. A radical operation was done; all the stones were removed and the gall bladder and common duct were drained. Nine days after operation the patient died—the necropsy showed from septic infection. If the condition of this patient had been realized when his gall bladder, free from obstruction, was found to be full of "white bile," and whether or no his common duct had been explored with a small needle to discover if similar contents were to be found in it, all attempts to do a radical operation should have been abandoned, and the gall bladder drained through a small tube. He would then have had a fair chance to recover temporarily. If, later, bile had been discharged through the tube in sufficient quantity, the operation should have been completed, as is now done in prostatic cases with a similar outlook.

In conclusion, I would like to raise an objection to the various textbook descriptions of cholecystitis. The terminations of cholecystitis are the same as the end-results of inflammation everywhere in the body. They may be catarrhal, or ulcerative, or phlegmonous, or suppurative, or gangrenous, or anything else adding to the difficulties of understanding them, but that should cease to be the teaching of writers who are to train the younger surgeons.

II.—FARQUHAR MACRAE, M.B.,

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For the formation of gall stones in the gall bladder there seems little doubt that two factors are essential—namely, bacterial infection and a degree of stasis. In no experimental work has it been found possible to produce definite concretions without the combination of these two conditions.

It seems just possible that pure cholesterin stones, or more commonly a single cholesterin stone, may develop in the gall bladder in the absence of infection. While experimental work gives no support to this view, and indeed tends to throw doubt on the possibility of its occurrence, the clinical history of cases in which such a stone gives occasion for surgical intervention clearly gives support to the view that such stones may be formed without any contamination of the bile by bacteria. Unlike the mixed gall stone the pure cholesterin stone gives rise to no premonitory symptoms before a block in the cystic duct takes place, and the hydrops of the gall bladder which follows is never associated with the development of an empyema of the gall bladder.

There is, of course, the possibility that, at the beginning of the development of such a stone, there may have been infection which has subsequently been washed away from the gall bladder by the flow of bile; but in these cases the invariable absence of prodromal symptoms before the cystic duct is occluded and the freedom from development of pus in the gradually distending gall bladder make this rather an unlikely hypothesis. The great majority of the cases of cholelithiasis which require consideration by the medical man belongs to the class in which the stones are mixed in character, and there seems no doubt that in all of them the two factors of infection and stasis are present, at least at the beginning of the formation of the stones.

In test tubes cholesterin has been precipitated from normal bile to which have been added bacteria, especially *B. coli*, and there seems little doubt that the deposit of the main cementing substance, calcium bilirubin, depends on the precipitation of this substance from bile by the excess of mucus which is excreted as a result of a catarrhal condition of the gall bladder. The exact course of the infection has been a subject of much dispute, the majority of those who have written on the subject claiming that the mode of infection is by way of the portal circulation and liver to the ducts and then the gall bladder, while others believe that the infection takes place directly from the systemic circulation. It is possible that both modes occur; but there seems no reason to doubt that in the great majority of cases, if not in all, the infection of the gall bladder takes place by way of the ducts.

It has been proved experimentally that animals fed on material contaminated by bacteria, and in whom the common duct has been ligated, will within a few hours give cultures of the ingested bacteria from the gall bladder and ducts. That this is not an accidental contamination unassociated with the ingestion of bacteria has been fairly conclusively shown by the use in these experiments of *B. pyocyaneus*, which is not under ordinary circumstances found within the bile passages.

It is, of course, true that micro-organisms present in the general circulation can also be obtained in the gall bladder and bile ducts; but this in no way negatives the view that they reach these places through the avenue of the portal vein and liver. Two features, which do not appear to have been emphasized, seem to me to point more directly to the latter being the usual mode of entrance. The first is that in order to give rise to a stone-forming catarrh in the gall bladder the bacteria require to be attenuated, and it seems likely that this process of attenuation most probably occurs during their passage through the liver. The other is the infrequency with which abscesses develop in the wall of the gall bladder, even when the wall is greatly thickened. In about 500 gall bladders with which I have had to deal I have only seen two in which this had occurred. In both cases the gall bladder was much thickened and in both the abscesses were multiple, and therefore an embolic origin was suggested. In both also the offending micro-organism was *B. coli;* but in neither were there any symptoms to suggest a septicaemia, and in both the removal of the gall bladder led to the immediate disappearance of all symptoms. It is quite possible, therefore, that, even in these cases, the infection which led to the development of the abscesses took place not through the blood circulation but by way of the lymphatics. If the infection of the gall bladder took place at all frequently through the systemic circulation one would expect to find much more frequently than one does abscesses develop in the wall of the gall bladder where it has been much thickened.

Another fact which points strongly in favour of the view that the bacteria reach the gall bladder by way of the ducts is the frequency with which pancreatitis is associated with cholelithiasis—the inflammation being limited as a rule to the part of the organ which is in most direct connexion with the bile ducts. Direct infection upward from the duodenum has been held to play a part in the infection of the gall bladder, and it has been shown experimentally by Bond that such a process can occur. On the other hand, no part of the bowel is normally as free from infection as the duodenum; indeed, it is probably sterile save when food is passing through, and during the time that this is occurring there is an intermittent expulsion of bile which presumably will prevent any invasion of the common duct from the bowel. Taking everything into consideration, there seems every reason to believe that the usual, if not the only, mode of introduction of the infection is by way of the portal circulation and liver.

The origin of the stasis of bile is not so readily understood. It may be due to any condition which increases the viscidity of the bile, or to any interference with the calibre of the ducts from external pressure or from kinking. That the former condition is probably a main factor in some cases is, I think, shown by the very much greater frequency with which gall stones are said to be found in the *post-mortem* room in individuals dying from heart disease than in those who die from other causes.

In the majority of cases this undue viscidity of the bile does not appear to be the main cause, and one must look for some external source of interference with the flow of bile in the ducts. It appears to me to be likely that the suggestion of Waugh that this cause may be found in the drag of a mobile ascending colon will be found to be the probable explanation in the great majority of cases. It is certainly noteworthy that the majority of the usually accepted predisposing causes of gall stones are all such as tend to exaggerate any ptosis which may be present. All of them are such as to lead to diminution in the tone of the muscular wall of the abdomen, and thus, by allowing a prolapsed colon to sag further, will be likely to lead to more or less kinking of the bile ducts.

In the case of one of the commonest predisposing causes—pregnancy—it is quite possible that the increased cholesterol in the blood and the direct pressure upwards of the gravid uterus may be important factors; but the infrequency with which gall-stone colic occurs during the course of pregnancy appears to me rather to negative the view that direct pressure takes much part in interfering with the flow of bile. It is more likely that repeated pregnancy acts by the ptosis of the abdominal organs which supervenes on labour leading to kinking of the ducts. Very much in support of Waugh's view is the undoubted fact that recurrent attacks of cholecystitis may entirely cease in such cases after the ascending colon has been fixed in accordance with his method. Since he drew attention to this possible cause for the relative stasis of the bile, I have noted the condition of the colon in all of the cases of gall stones on which I have had to operate, and in all the ascending colon has been unduly mobile. It appears to me that we have in this suggestion the probable explanation in the majority of cases of the second factor, relative stasis of bile, in the etiology of gall stones.

A well-developed case of cholelithiasis presents no particular difficulty in diagnosis if seen during the hepatic colic. The character of the colic, coupled with the site of the pain under the right costal margin, radiating to the back, and the tenderness in the same situations usually make the diagnosis one of little difficulty, especially if, as is usual, there is some degree of dilatation of the gall bladder, sufficient to render it palpable even under the rigid upper right rectus. The only conditions which could readily simulate it are perforation of a pyloric or duodenal ulcer, renal colic from stone or from infection with *B. coli*, appendicitis, acute pancreatitis, or pancreatic calculus.

In differentiating between hepatic colic and gastric or duodenal perforation the characters of the antecedent dyspepsia in cholelithiasis, to be spoken of later, are of the very greatest importance; but, even without such a history, which in the condition of the patient may not readily be obtainable, the local signs, if they are carefully observed, are such as to make a mistake unlikely. First in importance is the extent of the rigidity of the abdominal wall. In every case of perforation of gastric or duodenal ulcer into the free cavity of the peritoneum, in the early stages and for some hours after the onset the whole anterior muscular wall of the abdomen is rigid and board-like and gives no relaxation at the end of inspiration or expiration. On the other hand, in hepatic colic, as in all cases of limited peritoneal irritation, the muscular rigidity is limited to an area corresponding to the inflamed peritoneum and gradually fades as one tests it by moving the pressure away from the area implicated.

In hepatic, as in all other colics, the patient does not lie quiet and resent movement, but tends to toss about seeking, but not obtaining, relief to his distress; whereas in perforative peritonitis involving the upper abdomen the patient lies quietly on his back, usually with his legs drawn up, and never tosses about. If the patient be turned on his side and heavy percussion be made to the right of the spine from above downwards as one approaches below the angle of the scapula a sudden acute exacerbation of discomfort, often felt most pronouncedly in front, will be found to take place in every patient suffering from hepatic colic, while no such localized alteration in the amount of discomfort will occur in perforative peritonitis.

Should vomiting occur it is more likely to be repeated in hepatic colic than in perforative peritonitis, and whereas in the latter it has little effect on the pain, except to aggravate it at the moment of emesis, in the former it is quite usual at and immediately after the act of vomiting to have the pain moderated or even to have it disappear entirely, only for it to recur within a few minutes with its original intensity. Further, the pain in perforative peritonitis is never so characteristically colicky in character as is the case in hepatic colic; usually, indeed, the intensity of the pain does not vary except with change of position or on manipulation of the abdominal wall.

Renal colic, whether depending on calculus or on infection of the pelvis of the kidney with *B. coli*, may simulate hepatic colic quite closely. In neither of these renal conditions need there be, though there usually are, other signs or symptoms suggestive of infection of the urinary tract, nor is it invariable, particularly in *B. coli* infection, to have the pain radiate down the course of the ureter. It is in cases such as these that the difficulty will arise, but even in them the two varieties of colic may be distinguished usually without difficulty. If the back be percussed in the fashion mentioned above it will be found that in hepatic colic the site where percussion gives rise to greatest pain is just under the angle of the scapula, whereas in conditions giving rise to colic originating in the pelvis of the kidney the site of the greatest pain is at a distinctly lower level over the last two ribs. Direct pressure, in the case of an inflamed gall bladder, is most painful just under the right costal margin in front or midway between that and the umbilicus; but in renal conditions the tenderness is most pronounced when pressure is made behind and just below the last ribs. In *B. coli* infection of the pelvis of the kidney, which is more frequently unassociated with other urinary symptoms than is calculus, examination of the urine will always show the presence of the micro-organisms though there may be no pus or albumin. In renal conditions no history of preceding dyspepsia is to be obtained, while in almost all cases of hepatic colic there has been, previous to the acute symptoms, a more or less prolonged story of gastric disturbance.

Appendicitis should not, except rarely, give rise to difficulty in diagnosis, even when the disease is associated with an imperfectly descended caecum. The real difficulty is that very occasionally the pain in gall-stone colic radiates to the right groin, and thus may mislead the unwary. In appendicitis it is very unusual for the acute pain to start with such dramatic suddenness as is the rule in hepatic colic. When the pain becomes localized it does so at a much lower level than is the case in gall-stone colic, and the site of maximum tenderness is similarly placed. There is no exaggeration of the pain by percussion over the angles of the ribs below the scapula, and vomiting does not relieve the pain of appendicitis, but rather tends momentarily to aggravate it. Further, recurrence of vomiting, though not so prominent a feature as in pancreatitis, may and frequently does take place during severe hepatic colic, whereas this is very rare in appendicitis unless the general peritoneal cavity is widely involved in the inflammation, and before this has had time to occur a correct diagnosis should be assured.

Acute pancreatitis presents particular difficulty because of its frequent association with the presence of gall stones in the gall bladder, often indeed with preceding overt manifestation of their presence in the shape of previous attacks of hepatic colic. The pain in this disease, though frequently colicky in character, remains localized to the epigastrium and left hypochondrium and never passes to the right costal margin. If it shoots towards the back it is always to the left of the middle line and not to the right as in hepatic colic. Vomiting is an early symptom, and is so frequently repeated that it simulates that occurring in intestinal obstruction rather than what obtains in hepatic colic. It is associated with persistent nausea, and the act of vomiting does not at all frequently give even temporary relief, in both these respects differing from what usually obtains in hepatic colic. The rigidity is limited to the same area as that affected by the pain, and is epigastric or under the left costal margin. It is never so pronounced as over an inflamed gall bladder, and is usually so comparatively slight that one is able to appreciate that under the abdominal wall is a diffuse swelling corresponding roughly in shape and distribution with the distended inflamed pancreas. Pressure in the left costal-iliac space, if

present, as it is said to be not infrequently in acute pancreatitis, would be a complete proof that one was not dealing with a case of hepatic colic. In pancreatitis the collapse which is present is associated with cyanosis, sometimes with mottling of the abdominal wall, whereas the collapse associated with hepatic colic is accompanied by pallor.

Pancreatic calculi do not present many symptoms that enable one to differentiate between them and gall stones. I have never seen, or at least never recognized, such a condition; but it is said that the pain is referred to the left side rather than to the right, that in a large proportion of these cases there is intermittent or constant glycosuria, and that in a large percentage of such cases, in the absence of jaundice, calcium oxalate crystals are found in the urine. The only method which enables one to distinguish absolutely between the two conditions is the use of the *x* rays. It is rare by this means to get evidence of the presence of gall stones, whereas pancreatic calculi always give a dense shadow.

While a well-developed case of cholelithiasis presents symptoms that unmistakably point toward the source of the trouble, it is only in a very small minority of cases that one gets anything approaching hepatic colic in patients who yet are troubled with gall stones. In practically all patients who are the subject of gall stones careful inquiry will elicit a history of preceding persistent indigestion of longer or shorter duration before the onset of colic, and all patients who are subject to attacks of hepatic colic will be found in the intervals to be constantly troubled with indigestion which presents fairly characteristic features.

The main features which characterize the indigestion of gall stones, and which usually enable one to distinguish it from a similar condition arising in the stomach or duodenum, are three in number. First, it is not materially affected by variations in the character of the food ingested: it occurs equally after a light or after a full meal, though it may not be quite so intense; secondly, it is constantly present over long periods, and does not show the longer or shorter remissions of freedom from pain which almost invariably obtain in gastric or duodenal ulcer; and thirdly, it does not recur so regularly at a stated interval after meals, but tends to be variable in the time of onset and may occur through the night.

The character of the indigestion is that of a flatulent dyspepsia, associated with what the Americans very accurately describe as "gas pains," which is so frequently associated with gall stones that patients come to look on it as a normal happening, and in many cases will not mention it unless it is specially inquired for; but if that is done, in my experience, they almost invariably admit its existence. So frequently is it present in gall stones and cholecystitis (though, perhaps, less regularly so in the latter) that I think it may safely be said that the vast majority of well-nourished patients who are constantly and persistently the subject of gastric flatulence either have gall stones or cholecystitis. It is a striking fact that such patients may have this "indigestion" persisting over a period of twenty or thirty years without any interference with their general nutrition, in this respect differing markedly from those who are the subject of gastric ulcer, but resembling a fair proportion of those suffering from duodenal ulcer. Of course, gastric flatulence may obtain in any patient who has a chronically dilated stomach; but these always show evidence, both local and general, of the existence of this condition, and in particular they invariably show signs of malnutrition. Further, when the eructation of gas is due to dilatation of the stomach in the course of a few years the gas tends to be malodorous. This never occurs in the cases due to gall stones.

It is in these less typical cases that Mayo-Robson's observation of a tender spot about midway between the umbilicus and the ninth costal margin in gall-stone disease becomes so valuable. In my experience it is in these "silent" cases of gall stones that one almost invariably gets this sign, while in the more advanced cases with colic the point of greatest tenderness is more frequently just under the costal margin at the most prominent part of the costal cartilage or between this and the xiphoid. Some—though only a small proportion—cases of cholelithiasis are practically indistinguishable from duodenal ulcer. In these, as in duodenal ulcer, pain comes on regularly about two hours after food, and is immediately relieved by the taking of food, and the *x*-ray picture may not be sufficiently characteristic to enable one to distinguish between the two conditions. It is of course unusual to come across patients suffering from duodenal ulcer in whom there are not considerable periods of time during which all symptoms are in abeyance or in whom variations in the character of the ingesta do not affect the intensity of the symptoms; but occasionally such cases do occur, and I am not aware of any means by which such cases can be differentiated from the anomalous cases of cholelithiasis in which "hunger pain" is the prominent feature.

The symptoms of the single cholesterin stone, when that does give trouble, are so characteristic as to present no difficulty in diagnosis, since the progressively distending gall bladder is always preceded by hepatic colic of great intensity without any antecedent symptoms, gastric or other, pointing to trouble in the region of the liver. The only error which is likely to occur is to mistake a distended gall bladder for an enlarged kidney—a markedly distended gall bladder always being found pointing outwards and not, as the textbooks say, towards the umbilicus.

TREATMENT.

The radical treatment of gall stones, as distinguished from the treatment of the symptoms in cholelithiasis, is purely a question of when the surgeon should intervene. There is no medical treatment save that which may be directed to diminishing the liability to attacks of colic, or to palliate the dyspepsia which is the sequel to the presence of gall stones in the gall bladder. It is very doubtful whether much can be done that is effective in either direction. There seems little doubt that an attack of colic in the ordinary case of gall stones is the result, not so much of displacement of stones as of an increase of the inflammation in the gall bladder, and it is just possible that a similar statement may be true of the origin of the dyspepsia, though the persistent character of this latter symptom renders this explanation unlikely. The removal of any septic focus, especially if that be located in the area drained by the portal vein, is an obvious indication, and similarly the avoidance of constipation would give some hope that the attacks of colic may be diminished in frequency. Any attempt to render the bile antiseptic by the use of such drugs as urotropine in doses which would not do harm otherwise seems to me to be quite obviously futile, and, laboratory experiments to the contrary notwithstanding, it is very doubtful whether by the use of any drugs the bile can in practice be so altered in consistency as to have any material effect either in altering its amount or its rate of expulsion.

Though no alteration in the character of the food ingested will in most cases entirely abolish the dyspepsia associated with cholelithiasis, this is aggravated by the taking of much green vegetables or of an excess of starchy foods, and these should be avoided.

Admitting that there are no medical remedies which can cure patients afflicted with gall stones, it does not follow that all cases of cholelithiasis demand operation, even if consideration is limited to those in whom the general condition of health is such as not in itself to contraindicate surgical intervention.

The great majority of the victims of cholelithiasis suffer throughout only from indigestion, and if they are willing to submit to the discomfort and inconvenience of this it is doubtful whether the surgeon is justified in urging operation on them. It is quite certainly not justifiable to urge it on such grounds as is contained in the assertion by a well-known and rightly distinguished surgeon, that "the danger of carcinoma alone is five times as great as is the mortality following operations for the relief of simple gall-stone disease." Such an assertion deserves no credence whatever. It is true that his statistics show that the incidence of carcinoma in the cases coming under his care is in that proportion greater than the mortality among those subjected to operation for simple gall-stone disease. But this in no wise justifies such an inference as he makes. Before any accurate decision as to the incidence of cancer in cholelithiasis can be made, it would be necessary to ascertain the total number of individuals who have had gall stones in a certain community and the number of those who have developed cancer in the gall bladder or bile ducts. As the great majority of those who have gall stones suffer merely from indigestion and in many cases probably never consult a medical man for this, or, if they do, are treated for their symptoms without any accurate diagnosis being made, it is obviously impossible for anyone to state what the true incidence of cancer in this disease is.

No doubt if a patient consults a surgeon for more or less long continued indigestion and a diagnosis of gall stones is made it is right that he should be told that the only cure is by way of surgical operation; but it is very questionable to

my mind whether under these circumstances the surgeon is justified in urging the patient to submit to operation.

The position is altogether different where there has been an attack of colic, and still more where there have been repeated attacks of this nature. In the former case, while no doubt in a fair proportion of cases there are gross structural alterations in the gall bladder and infection of a minor grade in the ducts and affecting the head of the pancreas, it is frequently impossible to be quite certain of this; whereas in the latter the mere fact of colic indicates a more severe infection in the gall bladder with a much greater probability, if not indeed a certainty, of infection of the ducts and inflammation of the pancreas. A single attack of gall-stone colic, unless the general condition of the patient contra-indicates it, is, in my opinion, a good ground for urging operation on a patient, and still more, of course, if the hepatic colic has been repeated. It is difficult for a surgeon to say in what proportion of patients only one attack occurs, but the impression I have gathered from talking the matter over with the only class of the profession who are in a position to know, the general practitioners, is that it is distinctly unusual for a well-marked attack of cholecystitis with colic not to be followed at longer or shorter intervals by others. As repeated attacks, by inducing contraction of the gall bladder and the formation of adhesions, make the operation not only more difficult but more dangerous, it is clearly the duty of the surgeon consulted by anyone who has a well-marked attack of cholecystitis, not merely to advise operation, but to urge it on the patient. It is, of course, true that in the hands of the expert surgeon the mortality from operation in cases of cholelithiasis in the early stages would be small, and if all cases were operated on in this stage it is equally true that the mortality of the cases now operated on, including as it does those with all sorts of complications, would cease to be so high as it is. But it seems to me to be very open to question, in view of the enormous number of people who possess gall stones, whether the total of those who would die if all these were to be operated on would not be greater than is the case with the adoption of less strenuous surgery. In my experience, at any rate, it is unusual for serious complications, other than gangrene or empyema of the gall bladder—in each of which the indications for operation at the time are clear—to occur unless there have been repeated attacks of cholecystitis, and it seems to me that the proper course for the surgeon is to wait until hepatic colic has occurred before he feels justified in urging operative interference, though patients with the minor symptoms should be told that operation will completely remove their symptoms and obviate the possibility of more serious conditions developing. The choice between the two evils should be left to them after the matter has been explained.

Operation having been decided upon, the question of whether cholecystectomy or cholecystostomy should be done must be considered. Where gangrene of the gall bladder is present or an empyema has developed, where the gall bladder is much thickened or has lost its elasticity and is found contracted round stones, where the so-called "strawberry bladder" is present, or where there are stones in the cystic duct, whether impacted or not, there seems little doubt that the only wise course is to remove the gall bladder. If this is not done it is highly probable that symptoms will return in the course of a few months or a year. Under the circumstances noted above, the only condition the presence of which would make one hesitate to perform cholecystectomy would be a well-marked chronic pancreatitis. When that is present the proper procedure would be to do a cholecystenterostomy or cholecyst-gastrostomy if the condition of the gall bladder makes that feasible, or to drain the gall bladder for a long time if it is not possible to make an anastomosis.

When the gall-bladder wall is merely slightly thickened and the gall bladder not materially altered in size the procedure is not so obvious. The consensus of opinion among the best known authorities at the present time is all in favour of the removal of the gall bladder; but before agreeing to follow the advice offered by them it is perhaps worth remembering that these authorities are the same who in the past have published long series of cases of cholelithiasis treated only by removal of the stones and drainage, with perfect cures in all those surviving. I sometimes doubt whether great authorities are always wise counsellors. Largely because of their eminence in some special department of surgery they tend to have sent to them for treatment the more difficult and complicated cases, and I have sometimes thought that as a consequence of this feature of their practice they sometimes lose a sense of proportion. They seem also sometimes to forget that operative procedures which they can safely perform cannot be carried out with equal impunity by less experienced surgeons.

If it could be proved that the removal of the gall bladder is less likely to be followed by symptoms than is a cholecystostomy then it might be wise, even though the mortality from the former operation is slightly greater, to do the major operation as a routine. It appears to me to be extremely doubtful whether this is the case. Recurrence of stones in the common duct appears to be at least as frequent after cholecystectomy as is their reappearance in the gall bladder after simple drainage has been carried out. That other complications may occur after removal of the gall bladder is, I think, clearly shown by the fact that during the past year I have operated on three cases of acute or subacute pancreatitis within two years of the patients having been deprived of their gall bladders without drainage.

Chronic pancreatitis is so frequent a sequel to cholelithiasis that I have always hesitated to remove the gall bladder where it could be left, lest one should deprive oneself of the only really efficient method of dealing with this condition should it not subside, by making an anastomosis between the gall bladder and the stomach or duodenum. Judging by my own experience of cases which have required to have their abdomens opened at some date subsequent to operations on the gall bladder, I should say that adhesions of a crippling character are more frequent after cholecystectomy than after cholecystostomy.

It is not from statistics collected by surgeons, still less from statistics of their own cases however honestly given, that the decision whether the gall bladder should be removed or not ought to be made. It is the general practitioner, who has to live "round the corner" from his patient after the surgeon is done with him, who alone can give a real statement as to the relative frequency of late symptoms after a particular operation, and it would be a great boon if this matter could be gone into by collecting statistics from a sufficient number of them to decide this question. As it happens none of those with whom I have discussed the subject have displayed any preference for the major operation, while some have been emphatic in the opposite direction. Should it be decided to remove the gall bladder I would advise that this be done beginning at the fundus rather than at the cystic duct. If this rule were followed there would be fewer cases of injury to the hepatic or common ducts than one is inclined to believe occur.

Believing as I do that the real danger in cholelithiasis lies in the infection accompanying it, I have always arranged for drainage alike where cholecystostomy or cholecystectomy has been performed, and for the same reason I have always hesitated to do the so-called "ideal" operation of cholecystotomy notwithstanding the able advocacy of so distinguished an authority as Professor Rutherford Morison.

DISCUSSION.

Mr. D. P. D. WILKIE (Edinburgh) said: Professor Rutherford Morison indicated what great advances have been made in the last twenty-five years in the diagnosis of gall stones. The early reflex digestive disturbances and mild attacks of cholecystitis are now taken to be sufficient evidence to indicate the necessity for operative interference, and we no longer wait for the symptoms once held to be classical but now known to be the evidence of complications which should be anticipated and not awaited. Increasing experience and improved apparatus are now bringing the *x*-ray demonstration of gall stones into the field of practical diagnosis and ere long I feel sure this will become a routine clinical method. The use of the duodenal tube, while in its infancy in this country, is sure to play an important part in the diagnosis and probably in the treatment of many, and particularly of the more obscure, infections of the biliary passages. Now that we know how to relax the sphincter of Oddi the problem of biliary sand and chronic cholangitis should be simplified considerably.

As in so many discussions on this subject, attention tends to be focused on the question as to whether cholecystostomy or cholecystectomy should be the operation of choice in dealing with cases of gall stones. Whilst we cannot for a moment regard the gall bladder as being an organ without any definite and possibly quite an important function to

perform, we know that it can be dispensed with without any notable inconvenience. We have now very strong experimental proof that infection reaches the gall bladder by the blood stream—that is, by the cystic artery. We know that micro-organisms can frequently be grown from its submucous coat when the bile and the surface of the mucous membrane are sterile. It is this cryptic infection of the wall which prompts removal as opposed to drainage of the gall bladder. The gall bladder has been compared to the urinary bladder, but I think that it were a fairer comparison to say that in this question of infection it occupies an intermediate place between the urinary bladder and the appendix. We do not think of opening the appendix, removing concretions, and closing it again, because we know that the wall is usually infected and damaged. If, therefore, we regard the infected gall-bladder wall as the primary seat of mischief in most gall-stone cases, if further we recognize it as a focal infection, a source from which other infections, pancreatic and much more distant, may arise, our obvious duty is to remove it unless by so doing we are either adding appreciably to the immediate risk of the operation or are depriving the patient of an alternative biliary channel of which there is some likelihood there may be need at some future date. Accordingly my practice is to perform a cholecystectomy in all cases where the gall bladder is obviously diseased, except those where technical difficulties make it fraught with added risk to the patient, and in those where a dense sclerosis of the head of the pancreas foreshadows a possible secondary obstruction of the common duct for which a cholecystenterostomy might be required. In two such cases in which I had at a first operation removed the gall bladder I would have given much at the second to have had it back again.

Too much has possibly been made of this question of removal of the gall bladder to the exclusion of the more important question of the common duct, which is the *pons asinorum* of gall-bladder surgery. Operations on the biliary passages include some of the most difficult in the whole field of surgery. Unless the surgeon is prepared to explore fully and deal with any of the varied and often complicated conditions which may confront him he should leave this class of case alone. It is no field for the surgical dabbler; and, further, it is one where incomplete operation makes the subsequent handling of the case a matter of great technical difficulty. As Professor Rutherford Morison has taught for so long, free exposure of the parts with accurate assessment of the full extent of the pathological process and the adoption of methods adequate for this are the two essentials. Beside these, the question of removing or of leaving the gall bladder is one of entirely secondary importance.

Mr. Archibald Young (Glasgow) said: There are great names in our profession, and the bearers of these names are worthy of our respect. Their opinions, especially when given carefully and with consideration, deserve instant and adequate consideration in return. But with all this in mind we are—even the humblest of us—bound to reserve our individual rights of private judgement on any of the problems that concern us in our daily work. Mr. Rutherford Morison's name is one of the great names of our day by reason of his original work in surgery and of his vigorous and independent thought. To me, personally, his name has been, since ever I had reached the stage in my medical and surgical career to be able to appraise for myself the surgical importance of his investigations, one of a comparatively few of the great surgical names of the day in this country. I have had the opportunity of perusing, in advance, the general statement which Mr. Rutherford Morison has given of his position in respect of present-day views on gall-bladder surgery, and regarding etiology, diagnosis, and treatment of cholelithiasis. I was not unfamiliar previously with his general views on the subject, nor was I unaware of his vigorous personality or of his facility in defending any position he might find his most logical mind lead him to take up on a disputed matter. I have always admired his originality of judgement, his independence of thought, his enterprise in research, and his courage in cultivating new lines of attack upon difficult problems in surgery. If I preface what little I have to say on the subject of to-day's discussion by this most sincere tribute to the man and his work I do so as preliminary, I fear, to making for myself a profession or confession of faith which must run, in many important respects, almost directly counter to the views Mr. Rutherford Morison seems to hold to-day, much as he held them nearly thirty years ago. From what I have been able to gather of Mr. Rutherford Morison's personal attitude to other workers and other thinkers I am very sure that any divergence of view that I may be led to express will meet with his generous consideration.

First of all as to etiology—though that does not seem to come properly within the compass of the discussion—I wish to say quite definitely that I am not prepared, even at Mr. Rutherford Morison's direction, to dismiss the theory that would trace biliary calculus formation to a bacterial source. I do not think that "there is sufficient evidence against this view to condemn it." Not that I think the theory of bacterial origin meets all the facts, nor that it can ever be taken as adequate in itself. But, after all, in very few conditions, admittedly caused or at least contributed to by bacteria, does one pretend that other factors do not also come in. Indeed, there are almost always contributory agents which play a varyingly important part in etiology. But Mr. Rutherford Morison must surely be prepared to advance some sort of more or less definite substitute before he can expect us, at his fiat, to give up the bacterial theory, even in favour of his rather indefinite suggestion of a purely chemical cause. The predisposing causes which he cites are as consistent with a bacteriological cause as with any other. Indeed, in my view, they greatly add to the probability of it ultimately proving to be the correct theory.

The diagnosis of gall stones is not by any means the easy or plane-sailing affair that I confess my perusal of Mr. Rutherford Morison's statement would lead me to think he wishes us to accept. Most surgeons, I imagine, must have realized long ago how difficult it is in many cases to arrive at a diagnosis in respect of at least three conditions, which take origin and produce symptoms in the segment of the abdomen in which are situated gall bladder, pylorus, first part of duodenum, and head of pancreas—I refer more particularly to purely gall-bladder conditions, pyloro-duodenal ulcer or pyloric cancer, and pancreatic lesions. Indeed, the upper right quadrant of the abdomen furnishes material for many clinical problems, and not few are the conundrums which present themselves from that area, only to be solved when the surgeon opens the abdomen—if even then. Pain in that area, or even—and perhaps all the more if—referred to the shoulder, or to some other site related to the same or contiguous spinal segment, may equally well be the result of several different lesions, of which gall stones and cholecystitis form only one, and perhaps not the most frequent. Then there is the possibility of confusion between biliary colic and the pain associated with appendix lesions—not at all an infrequent difficulty. Of course, such initial difficulty may not greatly matter where the condition is not acute and where time remains to consider the case from various angles. But it is precisely in the urgent and critical cases that this possible difficulty perhaps most often emerges, and pain in these is often enough a very unreliable guide from the point of view of localization of the lesion causing it. Over and over again I have been asked to see a patient supposed to be suffering from appendicitis, only to form a quite different diagnosis: the condition either obviously one of gall stones, with very acute cholecystitis, or another lesion of an acute inflammatory kind, related to the upper right abdominal quadrant. But this must be a familiar problem to most surgeons of experience. For these and other reasons I would urge that what we most want is not to be told about the diagnosis of gall stones in a merely general way but to have worked out for ourselves and others something like a coherent and consistent differential diagnosis.

Treatment of gall stones, of the cholecystitis associated with them, and of related conditions such as pancreatitis, is, however, probably the more important part of to-day's theme. I can touch on only a few aspects. First of all, as to the mode of approach to the gall bladder and ducts. I have been accustomed to employ the upper right rectus incision—the Robson method, as I know it. I am aware that Moynihan and many others have advocated oblique or transverse hypochondrial incisions, and Mr. Rutherford Morison's incision has its supporters. We know how vigorously he is prepared to defend it himself. I understand that the Morison route of approach is advocated for two main reasons—(1) as giving the most free and adequate access to the gall bladder and ducts, (2) as giving, if required, an efficient route for drainage. Regarding the former, I can only say that I have found the Robson route give as free access as one can want, and one can enlarge the incision in a downward direction as much as may be required. Robson suggested its prolongation upwards as required. If properly made, it

takes one down, in nearly every case, directly upon the fundus of the gall bladder, and from there the region can be readily explored as may be proper. I am at one with Mr. Rutherford Morison as to the advisability of making a full and free incision. I have always been against any operative procedure that involves working in the dark. A generously made wound, no matter how large, cleanly cut, and not stretched and contused, will heal with far less risk of trouble, at the time or after, than a small wound which has required to be stretched and drawn upon to admit of the operative procedures being carried out at all. Further, it will have permitted of the most satisfactory carrying out of the crucial purposes of the operation. Regarding the second claim in respect of drainage, I am fully persuaded that I can procure as adequate drainage by the Robson route as by any other, provided that the patient is nursed in the Fowler—or, rather, the sitting-up—position. And when I say "sitting-up" I actually mean what I say. Often enough I have found it a little difficult to bring this home to new nurses or new house-surgeons. I have found by experience that this position is most comfortably secured by pillows alone. The patient is sat right up in bed, close up against a pile of pillows, say six pillows set flat on top of each other; and a further pillow is placed close up under the patient's knees, and kept from slipping away by a strong band from each end of the pillow tied securely to the top of the bedstead. The idea that by sloping the pillows the patient can be made more comfortable is a mistaken one, and has only the effect of causing pillows and patient to slide constantly from the proper position. In this bolt-upright position, the patient is comfortable, is seldom sick after the anaesthetic, and is assured, even with the Robson incision, of adequate free drainage. A final recommendation, in my opinion, of the Robson incision is the fact that hernia afterwards—no matter how much sepsis may have to be dealt with, or how long the wound may have to be drained—does not occur. I always, of course, close the wound in layers, leaving only the part where the drainage tube or the packing emerges. The only case in my experience where hernia followed upon one of my gall-bladder operations was the only one in which I was tempted to depart from the Robson incision in favour of an oblique transverse one. That may be, of course, only my luck, but the fact is there. Next, as to the type of operation to be performed, it seems to me that this is impossible of settlement on any general principle except this, that each case must be judged on its merits. In only a few cases is it possible to say beforehand, "This is a case for drainage of the gall bladder," or "This is a case for excision of the gall bladder." My own statistics show that the period of convalescence is considerably shorter after cholecystectomy than after cholecystostomy. One is not surprised at this, of course. The progress of events after the two operations is altogether different, and rapidity of closure of the wound must be different in each. It is possible to say, too, that the death rate after cholecystectomy is greatly less than after cholecystostomy. But that is not to say that cholecystectomy is safer as an operation in all gall-bladder conditions than is cholecystostomy. Indeed, it is not so. It merely implies that, in suitable cases, cholecystectomy is a safe operation in the hands of a competent surgeon. If death is more frequent after cholecystostomy—as my own and, I fancy, other statistics have shown—it is because that operation, while being the only correct line of treatment in certain grave cases for which cholecystectomy could never have been employed, has yet failed to save the patient. It has so failed, not because of defect in the operation as such, but because the patient has been so profoundly poisoned or so greatly weakened beforehand that no operative treatment could avail.

In conclusion, may I give certain facts and figures from my own records of operations on the gall bladder and ducts? They do not cover anything like the total number of gall-bladder operations that I have carried out, of very many of which, especially during the period of my earlier years of junior work, I have, unfortunately, no record. The figures are of cases of which I possess the records, in most cases fairly completely and carefully kept. The cases recorded number, in all, 91—78 females and 13 males. Cholecystostomy was performed, alone, in 50 of the 91 (Group 1); cholecystectomy, alone, in 25 of the 91 (Group 2); partial cholecystectomy, alone, in 7 of the 91 (Group 3); cholecystostomy *plus* choledochostomy in 4 of the 91 (Group 4); and cholecystectomy *plus* choledochostomy in 5 of the 91 (Group 5). In Group 1 (cholecystostomies), death took place in 5 out of 50. In Group 2 (cholecystectomies), death did not occur at all—all the 25 cases in the group recovered. In Group 3 (partial cholecystectomies), there was no death—all 7 patients recovered. In Group 4 (cholecystostomies, in which choledochostomy was done at the same time), death took place in 2 out of 4 cases. In Group 5 (cholecystectomies combined with choledochostomy), death occurred in 1 case out of 5. Or, putting these figures another way, 8 deaths occurred in the 91 cases—a percentage of 8.8. Of Group 1, 5 out of 50 died—a percentage of 10. Group 2 had no deaths—a percentage of 0. Group 3 had no deaths—a percentage of 0. Group 4 had 2 deaths out of 4—a percentage of 50. Group 5 had 1 death out of 5—a percentage of 20. When one comes to consider, however, what were the conditions present in the fatal cases it becomes evident, I think, that in few—indeed, in hardly any—could the type of operation adopted be regarded as, in itself, determining the fatal issue. In other words, in almost all, death resulted not because of any inherent defect in the type of operation, or in its execution, but from the intrinsic weakness of the patient or the already advanced stage of the disease. The causes of death in the 8 fatal cases were as given in the following list: (1) Profound toxaemia—death on twelfth day; (2) primary carcinoma of liver, originating in bile-duct epithelium (*post mortem*); (3) pneumonia—death on eleventh day; (4) primary cancer of common duct—death on sixth day (*post mortem*); (5) toxaemia, acetonaemia—death on second day; never rallied from anaesthetic; (6) carcinoma of pancreas—death on second day (*post mortem*); (7) haemorrhagic pancreatitis—death on fourth day; (8) general exhaustion, following prolonged suppurative cholecystitis untreated till late—death on fourth day after operation. Amongst the cases which recovered were many difficult and grave enough, requiring operative procedures testing not merely the endurance and physical powers of the patient but also the courage of the operator. In one case transduodenal choledochotomy was necessary; in many the appendix was removed at the same operation; in two cases gastro-jejunostomy was combined with cholecystostomy; in another case cholecystectomy was combined with appendicectomy and colopexy, according to Waugh. All these cases did well. It seems clear that it is something quite apart from the mere severity of the operation chosen, as such, that determines the issue, successful or the reverse.

Mr. R. H. PARRY (Glasgow) said: I have been reviewing my work on the biliary tract, on the completion of thirty years' work in the Victoria Infirmary, and I have been much impressed by the influence of delay both on the extent and character of the pathological changes in it. Even in the last five years of this period the number of cases of suppurating gall bladder and of large stones in the common duct were too numerous, and would suggest a lack of lead on the part of physicians and surgeons on the value of early interference. Draining of the gall bladder or excision of it must depend on the interpretation of the pathological changes as influencing the function of the gall bladder and of the possibility of infection spreading from it by the lymphatics to the contiguous structures. In a definite attack of gall stones we should emphasize the importance of early operative interference as we do in the first attack of appendicitis. I believe that if this were to become the rule, and were the same subject to be discussed at the next meeting of the British Medical Association in Glasgow, it would be found that the treatment had been very much simplified. It should also be more definitely recognized that the presence of large gall stones in the common duct, whether primarily formed there or discharged from the gall bladder, and the disturbance which attends their removal may lead to serious changes in the function of the duct and of the valve at its junction with the duodenum. Regurgitation of the contents of the duodenum into the common duct has been shown to take place in some cases previously operated on but which called for exploration and drainage of the dilated common duct for the recurrence of pain and jaundice. Any measure directed to the protection of the common duct and the maintenance of its full functions is of paramount interest and importance.

Mr. T. S. NOVIS (Bombay), in speaking of the infection of the gall bladder with the bacillus of enteric fever, narrated his experiences of a case in which a patient came to him with a discharging sinus connected with the gall bladder, the discharge from which contained typhoid bacilli.

Mr. R. D. Mothersole (Bolton) had had experience of a case in which drainage of the gall bladder had been performed by Robson, and the patient had been free from symptoms for ten years. Symptoms of cholelithiasis again appeared, and another operation (twelve years after the first) was performed; on that occasion the gall bladder was shrunken, and in the common duct there was a huge stone three by two inches. Another point of interest in the case was that the drainage tube at the second operation came out too soon, and after its replacement duodenal contents began to escape through it.

Mr. R. M. Handfield-Jones (London) said: The difficulties of diagnosis of gall stones having been alluded to this morning, and the increasing efficiency of *x*-ray methods by Mr. Wilkie, leads me to present to you a method which will render a radiological diagnosis correct in a very large majority of cases. I refer to the method of producing pneumoperitoneum. Some of those present will remember the very striking demonstration of such a method by Professor Carelli at the Royal Society of Medicine last winter. Briefly, oxygen or CO_2, or preferably a mixture of the two in equal quantities, is injected through a very fine needle into the peritoneal cavity. The injection must be done slowly and at no great pressure—a mercury blow-off prevents more than 10 mm. of Hg, and a mercury manometer in the apparatus will give the intra-peritoneal pressure. The dangers are—first, that the needle may penetrate the intestinal canal; this can be judged by a fall in the manometer reading on entering the peritoneal cavity and a rise if it enters the intestine; secondly, when the injection is complete (namely, about 500 c.cm.) the patient must not move himself at all during the taking of the plates; and thirdly, the gas must be removed before moving the patient from the table, by introducing a large bore cannula into the peritoneum. With regard to treatment, without going into the vexed question of cholecystectomy versus cholecystostomy, I would say one word about the technique of the former. I readily endorse Mr. Young's remarks on the desirability of starting the dissection at the fundus and not at the duct. The upholders of the latter procedure must take it for granted that in all cholecystectomies there is no induration of and around the cystic duct. As a dissecting-room exercise in a normal subject, the duct and artery are readily identified, but in those cases in which cholecystectomy is justified the structures of the pedicle are quite incapable of identification.

Mr. C. P. Childe (Portsmouth) was opposed to the employment of the transverse incision. He preferred an incision along the outer border of the rectus, and if further room were required the rectal sheath was divided and the rectus muscle mobilized. He narrated two cases where the use of the transverse incision had resulted in the formation of enormous inoperable ventral herniae.

Dr. Arthur T. Jones (Mountain Ash) thought that it would be of great advantage if the public could appreciate the necessity for speedy operation in gall-stone disease as they had in diseases of the appendix. The great difficulty was to get the public to submit to operation, as they did not sufficiently realize that although one attack had been recovered from another was a likely occurrence.

Mr. H. S. Souttar (London) said that when the gall bladder was drained every precaution must be taken to avoid typhoid infection in those handling the case, the organism being present in an active form in 4 per cent. of cases of gall stones. A median, or approximately median, incision was the only scientific one, the chief difficulty of the operation centering round the common bile duct, an almost median structure.

Mr. H. N. Fletcher (Brighton) said that Mr. Wilkie had emphasized the bacterial origin of gall stones. It was difficult on this theory alone to account for the fact that for every male who came to operation there were eight or nine females. There must be some other factors at work, and there were two, he thought, which were specially present in the female—namely, (1) increased cholesterol content in the blood, which, for example, was often notably increased by pregnancy and by sedentary habits, and (2) biliary stasis. Apropos of the first, he had observed that a large proportion of patients who suffered from gall stones were subject to migraine attacks, an occurrence which might possibly be explained by a hypercholesterolaemia. In regard to stasis, apart from its occurring from hyperviscid bile, there was the fact that visceroptosis, so much commoner in the female than the male, might, as Mr. Wilkie had suggested last year, cause duodenal stasis by the drag on the superior mesenteric vessels as they crossed its third part; and since Mr. Wilkie's suggestion he (Mr. Fletcher) had observed three cases of gall stones in which this was well marked and in which the proximal duodenum was much dilated. Again, there was no doubt, as Mr. Waugh had pointed out, that in some cases a proptosed proximal colon could, by its pull on the peritoneum passing from the hepatic flexure to the gall bladder and cystic duct, kink the latter. Given, then, an increased cholesterol blood content *plus* stasis, organisms reaching the gall bladder would find exceptionally favourable conditions for their growth. Much attention had been devoted to the "digestive" symptoms in gall stones. In the past year he had kept records of twenty-three cases, and found that, in a quarter of them, pain half to one hour after food, referred to the mid-epigastrium, was a prominent symptom, and that in nearly three-quarters of them prolonged flatulent dyspepsia was present.

DISCUSSION ON THE TREATMENT OF NON-MALIGNANT AFFECTIONS OF THE COLON.

OPENING PAPERS.

I.—Sir W. ARBUTHNOT LANE, Bt., M.S., F.R.C.S.,
Consulting Surgeon to Guy' Hospital.

When I was asked to open this discussion I willingly acquiesced, though I felt the honour was greater than I was able to do justice to.

Formerly it was customary to regard the several abnormal conditions of the colon as separate entities or diseases. Personally I do not accept this situation, but consider them to be one and all the direct or indirect results of chronic intestinal stasis.

In order to substantiate the accuracy and correctness of my views I must first draw your attention to the two great groups of conditions which I found in the living abdomen—namely, those cases of intestinal stagnation in which a reaction takes place and those in which it is altogether absent.

Group characterized by the Formation of Bands.

In the vigorous subject delay of the accumulated contents in the pelvic colon leads to the formation of acquired bands on the under surface of the mesentery securing the junction of the ileal and the pelvic segments of the colon. The mode of formation of this, as of all the other acquired bands which develop to hold up and secure a loaded colon, is very simple. They commence as streaks on the surface of the mesentery, starting from its base and encroaching gradually along its length. After a time they reach the wall of the intestine. The streaks soon become a distinct membrane, which at a later period may be separated from the mesentery except at its base and at its terminal extremities. This membrane tends to contract and to drag the bowel towards the iliac fossa, where it finally becomes firmly fixed. The fibres that grip the colon not only diminish its lumen by angulating it, but they also tend to reduce its calibre still further by rotating it on its long axis.

Like most of the efforts that Nature makes to help the individual to bear a useful relationship to his surroundings, this membrane serves a beneficial purpose in the first instance, tending to support the loaded bowel, and so opposing its elongation and prolapse. Later this originally useful structure tends by its contraction to obstruct the lumen of the bowel, and to place the life of the individual in serious peril. This membrane in its development is very liable to grip the ovary and Fallopian tube and to fix them immovably on the iliac fossa.

It may interfere with the function of the Fallopian tube, impeding the passage of the ovum through it and causing extrauterine foetation, or it may prevent the entry of the ovum and so render the patient sterile on the left side. Besides securing and fixing the ovary it sooner or later surrounds it, and causes it to undergo a cystic change. Later the degenerating ovary increases in size and bursts through the surrounding membrane and forms a mobile ovarian tumour.

Gynaecologists are only too familiar with the pain which women experience in the left iliac fossa and which is so often exaggerated by the approach of the period in the struggle of the bowel to force faecal matter through the anchored and obstructed colon over the sensitive ovary gorged with blood. These conditions have been referred to fully in *Guy's Hospital Gazette* in a paper by Mr. Chapple entitled "Pain in the lower abdomen of women" (*Guy's Hospital Reports*, 1921, vol. 35, p. 164).

To this particular acquired band and to its effect on the colon I gave the name of the "first and last kink." The first because it is the earliest of the acquired membranes to develop, and the last because it is the lowest in the drainage scheme.

This development of a band controlling the lumen of the lower portion of the bowel is perhaps the most important acquired change in the whole body, since it is the primary cause of a vast amount of subsequent trouble in the gastro-intestinal tract and elsewhere. Its immediate effect in producing an obstruction at this point is to render the partially occluded colon a very common seat of cancer, while in fat subjects the bowel proximal to it is a very usual site of diverticulitis. The indirect consequence of the obstruction to the passage of faecal matter through the first and last kink is the accumulation of material in the whole length of the colon. The increased load in the obstructed bowel results in the development of precisely the same type of acquired membrane on the outer layer of peritoneum which extends from the convexity of the large bowel to the abdominal wall. It serves to fix the colon and to prevent its elongation and prolapse. It is most marked in certain positions where the consequent constriction of the lumen of the bowel may produce inflammatory or cancerous changes. The localities so affected are immediately above the iliac crests, at the splenic flexure, below the gall bladder, where an acquired band from the liver, gall bladder, duodenum, and pylorus descends to hold up and later obstruct the transverse colon, over the outer aspect of the caecum, where it has recently been called Jackson's membrane, and again on the under surface of the terminal mesentery of the small intestine, which with the end of the ileum supports the caecum, forming its internal lateral ligament. In America this particular band has been given my name and is called Lane's kink.

What I want particularly to call attention to is that these so-called separate bands are all evolutionary, and identical in origin, function, and structure, and are due to the effort of the organism to meet an abnormal loading up of the bowel because of a distal obstruction, and to enable it to perform its function to the best of its capacity and not to prolapse. As I have already pointed out the initial purpose of their existence is carried out efficiently for a time, but later the continued contraction of the newly formed membranes results in obstruction of the lumen of the bowel and in consequent disease. This is usually most marked at the ileal kink (as I call the one named after me) and at the splenic flexure.

Too much attention cannot be paid to the mechanism of these acquired membranes and to the effect they exert both immediately and secondarily upon the functioning of the large bowel. When I first described them their existence was altogether denied. Later when they were found to be only too obvious the tendency was to regard them as separate and independent structures, to argue as to whether they were congenital or inflammatory in origin, or to assert that they have no influence whatever upon the normal function of the intestine. Mr. Chapple carefully examined fifty-two newly born foetuses in Guy's Hospital and could find no trace of bands similar to those present in the adult. This shows that they are obviously not congenital.

No one familiar with the appearance, structure, and mode of development of the bands in the living subject could regard them as inflammatory. On the other hand, anyone who has studied the several changes which the skeleton and soft parts undergo in the varying mechanical relationship of the individual to his surroundings can have no doubt as to their evolutionary origin.

Another important development which arises not infrequently in consequence of the strain exerted by the loaded caecum is what I called "the controlling appendix." It is one of very great pathological and clinical importance. This, like the ileal kink, has now been pretty generally accepted by surgeons. Instead of developing a membrane on the under surface of the mesentery of the terminal ileum the appendix is employed in the novel function of a ligament. It becomes attached by acquired adhesions to the under surface of the mesentery and therefore it lies behind the end of the ileum. By the gradual contraction of the acquired adhesions it is rendered progressively more tight. Its situation is such that when the ileum and caecum drop into the pelvis the ileum is kinked abruptly over the anchored appendix, and like an uninflated tyre hung over a hook its lumen is more or less occluded in consequence. This controlling appendix, or the equally damaging ileal kink, is responsible for very much of the ileal stasis and infection consequent on their presence and which play such an important part in the sequence of chronic intestinal stasis. The kinking of the anchored appendix itself renders its own lumen liable to become obstructed. Consequently inflammation follows, and this attracts attention to it. The removal of such an anchored appendix is followed by great benefit to the patient.

It is in this type of static colon that cancer commonly occurs, since the factors that determine cancer and which are simply mechanical are present in a more or less marked degree. Many of the patients are robust and are regarded as healthy people by the casual observer.

Group characterized by Absence of Bands.

The other extreme type of chronic intestinal stasis is characterized by a complete want of effort on the part of the organism to oppose the elongation and prolapse of the large bowel, no new acquired bands or membranes being formed. The pelvic colon becomes greatly elongated, and puddling in the pelvis this long, loose bowel forms many abrupt angles and offers a great obstacle to the passage of solid material through it, since the more the individual strains to expel the bowel contents the farther is the flaccid gut driven into the lower limit of the pelvis.

While in the type first described the acquired band forming the first and last kink constitutes the chief obstacle to the emptying of the colon, in this type obstruction is due to the great elongation and prolapse of the pelvic colon, so that the mechanical conditions are perfectly distinct in the two extremes.

Following on this obstruction the proximal colon elongates to a great extent and prolapses. As far as I know the mere prolapse of the rest of the large bowel in no way affects its function except in the case of the caecum, when it may twist the end of the ileum and obstruct its effluent.* This condition of the caecum and ascending colon may be greatly benefited by plicating the bowel or by the method of anchoring advocated so strongly by Mr. George Waugh. Curiously enough the prolapse of the large bowel, or as it is technically called enteroptosis, has monopolized the attention of most operators who attempt to relieve the symptoms of the patient by fastening the bowel in position or by excising portions of the elongated transverse colon. I have seen no permanent advantage from such operations in patients on whom I have operated subsequently since such conditions are obviously secondary and not primary.

In consequence of the obstruction to the passage of the intestinal contents which results from the elongation of the pelvic colon an infection of the mucous membrane of the proximal colon takes place, producing a condition called colitis. This infection causes a spasm of the muscle wall of the colon and a consequent reduction of the lumen of the inflamed bowel, so producing a very serious mechanical obstacle to the passage of material through it. As I have previously indicated, *the mechanical conditions are perfectly dissimilar in the two extreme varieties of stasis*, while between the two extremes every variety of degree and combination exists.

In this type there is no point of constriction at which hard faeces can be definitely obstructed, and therefore no area of impact where cancer is likely to develop. For this reason cancer of the colon is not seen as a sequel in this form of stasis, though it is common in parts of the body other than the gastro-intestinal tract. I have described this fully on many occasions.

I feel that it is most important from the point of view of treatment, medical as well as surgical, that we should render ourselves perfectly familiar with the exaggerated types I have described and with the intermediate varieties.

* This was described and demonstrated in a remarkable manner by Dr. Jordan.

Operative Interference in the Type characterized by the Formation of Bands.

In the first extreme type of stasis the condition which calls for operative interference on the colon apart from cancer is the obstruction caused by acquired bands, *by far the most important of which is that which produces the first and last kink.*

The operation that I perform with great frequency is the careful separation of the bands which form this kink and the accurate apposition of the peritoneal edges should any surface be left deprived of its serous covering. Other controlling bands are sought for and if present are divided. The termination of the ileum is examined, and should a controlling appendix or an ileal kink be present these are dealt with and any raw surfaces carefully covered in by peritoneum. If the membrane forming the ileal kink is at all extensive it is important, after freeing it, to leave a drainage tube in position, for the reason that the lymphatics which are divided in the acquired membrane contain septic organisms which, if not drained, readily escape and set up a local peritonitis which may terminate fatally.

The presence of such septic organisms in the area from which the acquired membrane was removed have been demonstrated by cultures made by Dr. Nathan Mutch at the time of operation. This fact accounts for many cases of unexplained fatal peritonitis in operations on the appendix. I may say that I go through this sequence most systematically when dealing with any of their sequelae, such as gastric and duodenal ulcer, gall stones, etc.

The other but very much less frequent complication in this type in fat subjects is diverticulitis. This usually occurs in the area of bowel proximal to the last kink, or it may develop in any portion of the large bowel behind an obstruction. If still definitely non-malignant, the most simple method of dealing with this diverticular formation in fat subjects consequent on obstruction is to put the divided end of the ileum into the pelvic colon. *In this case, as in that of colectomy, the patient should be instructed to secure three evacuations daily.* By such means any regurgitation of the contents of the ileum into the colon proximal to the junction can be readily avoided.

Occasionally it is advisable to excise the diseased area and to unite the proximal bowel to the pelvic colon. This must depend on the possibility of mobilizing the bowel and upon the nature of the intestinal wall. In some rare cases colectomy offers the best results.

Another complication of this type of stasis is tuberculous ulceration of the colon, which is frequently limited to its proximal half. For this a complete colectomy may be performed, or, if the condition of the patient renders it advisable to limit the extent of the operation as much as possible, the ileum may be divided and be put into the pelvic colon and the colon excised beyond the limit of the area affected by tubercle. What procedure is adopted must vary with the conditions present at the operation.

It is the opinion of certain experts in tropical diseases that dysentery only becomes chronic in those affected by intestinal stasis, and it has been demonstrated by Mr. J. W. Jackson in a most interesting communication ("The relation of chronic intestinal stasis to chronic amoebic colitis") in the *Medical Press and Circular*, May 3rd, 1922, that chronic amoebic dysentery can be frequently cured by freeing the intestine from obstruction by band or controlling appendix.

Operative Interference in the Group characterized by Absence of Bands.

In the second type of static colon the mechanical difficulties are in the first instance the elongated pelvic colon, and in the second the obstruction consequent on the spasm of the muscle coat of the bowel produced by the inflammation of its mucous lining.

The symptoms which call for operation in this type are not due so much to the pain and constipation or diarrhoea, but to the auto-intoxication which is the result of infection of the contents of the small intestine, which produces the most serious degenerative processes in every tissue of the body and renders the subject liable to infection by other diseases such as rheumatoid arthritis, tubercle, etc.

It would seem that the simplest operative procedure would be to excise the surplus pelvic colon and to restore it to its normal length; such a measure is beneficial in certain circumstances, but in the majority of cases the best results can be obtained by a colectomy or by dividing the ileum and putting it into the pelvic colon, taking subsequent precautions to secure the frequent evacuation of the pelvic colon which have been already indicated. Needless to say, no operation should be considered till every medical means have been taken to overcome the constipation, to allay the spasm of the muscle of the bowel by curing the colitis, and to free the ileal effluent.

I have described the operations of ileo-colostomy and of colectomy so frequently that it is unnecessary to repeat them again in detail. I would merely point out that in this type, as opposed to the other, colectomy is rendered very easy because of the prolapse and elongation of the bowel and by the absence of any retaining membranes.

A complication of the elongated large bowel which increases the obstacle to the passage of its contents is a twist. It is usually chronic, but owing to the abrupt exaggeration of the twist it may become acute and produce a volvulus. In certain cases I have excised the volvulus and in others I have performed a colectomy. The same treatment applies equally to the congenital enlargement of the colon, sometimes called megacolon.

As regards ulcerative colitis, when medical treatment has failed to bring about a cure of the condition, the only operation which has been of any real service in my experience has been a colectomy. Even after a colectomy prolonged local and vaccine treatment is usually necessary for a considerable period, to get rid of the residual ulceration which so often exists in the rectum and in the portion of pelvic colon which has necessarily been left in the body.

Much the same operative treatment applies to severe cases of mucous and membranous colitis, but it is resorted to much less frequently.

Before leaving the subject of these operative procedures I would urge the importance of attempting to avoid the sequence of conditions which result from stasis and which produce so much misery and death.

Cancer is the final stage in the sequence of chronic intestinal stasis. It is the last chapter in the story of defective drainage of the large bowel, as it is in the rest of the gastro-intestinal tract. Its treatment has been excluded from consideration in this discussion.

Another effect of infection of the badly drained colon is inflammation of the appendix. On the treatment of this complication we are in general agreement.

I cannot impress on you too strongly Colonel McCarrison's experience in India. He spent nine years in the Himalayas, during which time he did a large practice, performing more than four hundred capital operations each year. During that time he never saw one case of asthenic dyspepsia, of gastric or duodenal ulcer, of appendicitis, of mucous colitis, or of cancer, all evidences of chronic intestinal stasis in their normal sequence. I have obtained precisely similar evidence from other very experienced medical men who have been engaged in practice for many years among the primitive races.

It is clearly our duty not so much to devise new operations as to attempt to prevent the diseases for which so many operations are done. This is the biggest problem before the profession at the present moment, and it is one that must be solved.

II.—GEORGE WAUGH, F.R.C.S.,

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The study of non-malignant diseases of the colon might easily extend over several days; this Section has allotted a few hours to it, and the individual speaker must try to content himself with a few minutes. It is not possible, therefore, within such limits to do more than indicate an outlook upon diseases of the alimentary tract which appear to depend for their origin upon non-malignant affections of the colon; to outline a mode of investigation that can be conducted by every surgeon; and to suggest conclusions that may be reached only by the patient contemplation and criticism of results that have stood the test of time.

Disease has a biological aspect that cannot be ignored in considering functional disabilities of the alimentary tract as they manifest themselves in Nature's first experiment in upright bipeds—the human race. Structure and environment must have established an equilibrium that has rendered possible the survival of man as a healthy individual, and the failure of his alimentary tract to function in such a way as to maintain a high standard of health for him can only

depend upon a maladjustment of these two factors. The interplay of these two factors has long been studied from the aspect of variations of environment, but the variations of structure representing arrested stages of embryological development of the alimentary tract have received but scant attention. The environment of man's alimentary tract differs from the environment of that of the rest of the animal world in that it is exposed to the action of gravity as a consequence of his upright position—possibly a very significant difference, and one that would require a structure specially adapted to cope with it.

The colon more than any other viscus is subject to variations of position, fixation, and structure which reveal like geological strata the successive phases of its development; and the colon, as a reservoir of solid material that increases in weight by steady accretions during each twenty-four hours, should be essentially perfect in its development to resist the strain that gravity peculiarly imposes upon it. With these malformations of the colon, primitive forms of embryology of the omentum, the biliary apparatus and the small intestine are associated in variable degree, and from their intimate anatomical relationship to the colon they must be considered in any study of structural defects.

At this stage it may be well to enumerate the structural variations that have been observed before considering their possible significance and their effect upon our concepts of the origin of disease that manifests itself in terms of functional inefficiency of the alimentary tract. The series of observations have been made upon 518 operations for the purpose of finding structural variations and restoring them to type within the limits imposed by surgical procedure. At the same time they have been studied in a series of *post-mortem* examinations in 110 children under the age of 12 years by the surgical registrar, Mr. J. F. H. Stallman, at the Hospital for Sick Children, Great Ormond Street; the cases were consecutive as far as possible, they had died from many varieties of disease, and were not in any way selected. The following structural variations were found in these 110 children: in 38 there was a complete primitive mesentery to the ascending colon; in 9 there was a long primitive mesentery to the iliac and pelvic portions of the descending colon; in 14 Lane's parieto-colic membrane was present; in 45 there was a ventral mesentery to the gall bladder; in 1 the caecum was under the liver; and in 1 the foramen of Winslow was absent. The age of the youngest child with a primitive mesentery to the ascending colon was 1 month; with a primitive mesentery to the descending colon 2 months; with Lane's parieto-colic membrane 1 month; with a ventral mesentery to the gall bladder 3 weeks; with an absence of the foramen of Winslow 2 weeks; and with an undescended caecum 3 years.

The operation group may be subdivided into 396 adults and 122 children; of these an analysis of the first 308 cases appeared in the *British Journal of Surgery* in January, 1920, leaving for record to-day the findings at 210 operations performed since December, 1919, upon 188 adults and 22 children.

In all of these cases, 210 in number, the ascending colon had retained its primitive mesentery; entirely in 177 of them so that it could be lifted out of the abdomen in its whole extent, and placed upon the towels to the left of the middle line. In the remaining 33 cases it was tied down strongly at the mid-point, with the primitive mesocolon persisting in variable degree behind the segments above and below this point. This tie-band, which passes from the antero-external aspect of the ascending colon to the parietes in the immediate neighbourhood, appears to represent the site at which disappearance of the primitive mesentery normally begins; but in these cases the process had been arrested there.

It is thus a fixed point upon which the mobile portions of the colon above and below it exert traction and modify it by drawing out the fascia of the post-lateral abdominal wall in varying degree. It is *opaque, non-vascular*, and on cutting through it the cellular tissue covering the quadratus lumborum muscle is revealed. It has no feature in common, therefore, with the membrane which Jackson has described in the *Annals of Surgery*, 1913, as "a *transparent vascular* structure like a complete new layer of peritoneum, bearing a relation to the colon that may be likened to that of the pia arachnoid to the brain, with bright red blood vessels running parallel with the long axis of the ascending colon and extending over the anterior surface of the colon from hepatic flexure to caecum." He suggests that this membrane has been overlooked frequently on account of the smallness of the incisions used by many operators in opening the abdomen, which do not reveal the whole of the ascending colon. That criticism is not valid in this series of cases, in which the whole of the ascending colon was not only exposed but fixed along its whole length.

For nine years I have sought in vain for Jackson's membrane, persuading myself with difficulty that in two or three cases I had found something that bore some faint resemblance to the structure that he had described. But what has been present in these cases at the mid-point of the ascending colon is Lane's parieto-colic membrane, described by him in 1903, five years previous to Jackson's publication, and bearing the imprint in his description of it of his matchless mastery of anatomical detail. For the sake of historical and scientific accuracy it should be restored to its proper position in surgical literature under the title bestowed upon it by the distinguished surgeon who originally and accurately described it.

These are the chief variations in fixation, and those of position and structure must now be mentioned. In two cases the whole of the colon lay in the left iliac fossa and the left side of the pelvis, having made no attempt to rotate from its primitive embryonic position and retaining a primitive dorsal mesentery over its whole length.

In five cases the caecum lay under the liver—that is, rotation had been completed but descent had been arrested. In three of these cases the colon passed directly to the left from the caecum in the ordinary direction of the transverse colon, and with omentum arising along the whole of the horizontal loop; but in the other two the colon dropped down abruptly to the right side of the pelvis, so that with the caecum under the liver the hepatic flexure lay in the pelvis, and the ascending colon was actually upside down! From this prolapsed hepatic flexure the gut turned abruptly upwards to reach the splenic flexure, and only along the ascending limb was there an omental attachment. In these cases of subhepatic caecum the ileum made a steep vertical ascent for two to three inches along the side of the bodies of the lumbar vertebrae to reach the caecum, and was tied down as an entirely retroperitoneal viscus over that part of its course. That the ileum compelled to pursue a vertical ascent should be devoid of mesentery is not without interest.

In two cases the colon had completed its rotation, but had dragged an opaque membrane with it over the whole of the rest of the viscera, which, with the exception of the stomach, were entirely invisible; and one had the unique experience of cutting a small hole in this membrane, which was about a quarter of an inch thick, to prove that the patients did possess a liver! They had been treated as cases of gastric ulcer, but the stomach did not reveal any abnormalities of structure.

In 128 cases the transverse colon lay below or over the sacral promontory, and the stomach was prolapsed according to variations of attachment and length of the omentum which passed between the two—that is, an excessively long loop of transverse colon with a great depth of omentum would not necessarily be associated with a prolapsed stomach, since the omentum could continue to pay out as the colon sagged without becoming sufficiently taut to exert a pull upon the stomach; while, on the other hand, a shorter loop of transverse colon, with only a short omental attachment, would be associated with an equivalent prolapse of the stomach.

Thus a prolapsed colon can be present without a prolapsed stomach, but I have never seen a prolapsed stomach alone without a prolapsed colon during any operations upon these cases; and to treat gastroptosis without reference to the colon can only be done in ignorance of the precise relationship between the two established at operation.

Associated with these variations of position and mobility of the colon is an atrophy and dilatation of its structure. In all these cases the ascending colon was atrophic and dilated, these changes being most marked in its most dependent portion. These changes were also present in addition in the transverse colon, involving its right half only in 98 cases, and involving the whole of it up to the splenic flexure in 30 cases. This is an approximate classification that showed that a tendency existed for these changes to spread from the right to the left of the colon to an extent that varied with the chronicity of the case. In the descending colon a patchy distribution of these changes was confined to those parts of the descending colon that were excessively mobile from persistence of primitive mesenteries. Between the splenic flexure and the brim of the pelvis it was rare to find them when the gut was normally fixed, while the pelvic loop

appeared to be more and more ballooned in proportion to the length of the primitive mesentery that supported it.

In 5 cases the whole of the colon was atrophic and dilated from caecum to rectum; it could be lifted entirely out of the abdominal cavity, including the splenic flexure; and, although they were all under the age of 30 years and had drifted from bad to worse under all forms of treatment, I did not consider that surgery could step in at that stage with advantage, or with any hope of undoing the irreparable damage that had converted their healthy adolescence into a premature middle age.

Of associated structural variations a stout mesentery passing from the ventral aspect of the gall bladder and tying it down across the duodenum to the colon in the region of the hepatic flexure was present in 76 cases.

In 7 cases the foramen of Winslow was absent and was represented by a dimple in the posterior layer of the gastro-hepatic omentum, which then passed abruptly backwards to the posterior abdominal wall.

In 18 cases a stout membrane passed from the hinder edge of the under surface of the liver along its whole length, both in the greater and lesser peritoneal sacs to the viscera in immediate relationship with it, more especially the pancreas, the pylorus, the duodenum, the upper and outer aspect of the ascending colon, and the right kidney. At no point except at the extreme tip of the right lobe was it possible to pass between the liver and the diaphragm. Through these membranes—the one from the ventral aspect of the gall bladder and the one from the under edge of the liver—the mass momentum of the liver pounding up and down during respiration is transmitted to the viscera to which they are abnormally attached; and these are not normally subjected to such a stimulus. It is not unthinkable that such a stimulus may have some effect upon the blood supply, the nerve supply, or even the structure of the viscera implicated.

Time permits of no more than this hurried summary of gross structural variations present in patients suffering from gross functional inefficiency of their alimentary tract. The clinical features of these cases have already been described in full detail in the *British Journal of Surgery*, but characters peculiar to most of them in their early stages may be recalled briefly.

In their distribution they were independent of environment and no common environmental factor depending upon the differences of their social strata and personal habits could be detected as exerting any influence upon the onset of their diseases. The period of life during which functional inefficiency first manifested itself was common to most of them—between the ages of 18 and 25 years. Only a few of them had had an unhealthy childhood from diseases of the alimentary tract.

The initial symptoms were generally discomfort in the upper half of the abdomen that yielded to no remedies, and that was eventually overshadowed by pain that appeared during the course of a year. The pain also was generally experienced in the upper half of the abdomen, but was liable to variations of distribution, conduction, and character; whilst more than one kind of pain, together with a variety of discomforts, could be identified not infrequently in an individual patient.

One type is of particular interest, and was present in 97 of these patients, a type that has been described as "hunger pain," and that is peculiarly amenable to change of position from the upright to the horizontal, and is very frequently relieved by the taking of food.

Of all the alleged modes of origin of visceral pain there is one that has been translated from the realm of theory to the realm of fact, and it may be well to recall the experiments that established it beyond all dispute. Nearly thirty years ago Lennander of Upsala and Arthur Baker of London performed most of the present-day operations upon the alimentary tract under a local infiltration of the abdominal wall only with beta-eucaine and adrenaline. During the course of these operations it was clearly and scientifically shown that when tension was made upon a mesentery beyond a certain degree of tautness, pain was experienced by the patient, and no other stimulus elicited any sensation that the patient could record. Antecedence and consequence followed in an unbroken procession, establishing a law that there was a minimal strain for each mesentery which could not be exceeded without the production of pain.

The occurrence of hunger pains in patients possessing primitive mesenteries to their ascending colons, together sometimes with other embryonic bands, may well be reviewed in the light of these experiments. Not only is that mesentery peculiarly exposed to strain by the downward-acting weight of the colon and its load, but also the strain may be taken off it by change of posture and by shifting of the load. There is a time occurrence of these pains revealed by the patients so constant that they might well be renamed "four o'clock in the afternoon" pains and "small hours of the morning" pains. So infrequently do they occur at other times in the day that patients confess they are panic-stricken by such happening, although the majority of them had never had such an experience. With regard to their habits, most of them had eaten a good breakfast and a good midday meal, so that at about 4 p.m. most of the residue of both these meals would be in the ascending colon; a good meal was eaten again as the last meal of the day, the total residue from which would ordinarily be accumulated in the same site at about midnight.

By taking a cup of afternoon tea, a pinch of sodium bicarbonate, or a biscuit kept by the bedside for the purpose, the pain would be speedily relieved. It is known that by any act of ingestion into the stomach a gastro-colic reflex is initiated whereby the load from the ascending colon may be passed on into a more distal segment of gut; this presumably happened in these patients, and afforded them the expected relief.

Change of posture was temporarily effective if they could get their heels higher than their head; but the relief was purely temporary, and in some cases no relief at all was afforded when the ascending colon hung so far over the pelvic brim that it could no longer ride up on assuming such a position.

In the light of these facts it seems a reasonable inference that this particular pain does originate from the downward drag of the loaded ascending colon upon its own mesentery, and that the relief from the pain afforded by fixing the colon cannot be regarded as a pure coincidence.

None of these cases had duodenal ulcers discoverable by operation; 46 of them had already had the appendix removed—the purely epigrammatic solace for failing to find the ulcer or gall stones so confidently diagnosed in these cases—without relief to their symptoms; and the precise diagnosis of duodenal ulcers, together with those of gall stones and gastric ulcers, may well be grouped together as unscientific conjectures that are sometimes right.

By the time that pain had become an established feature of these cases general malnutrition, as shown by an average loss of 1 st. to 3 st. in weight, proceeded on its course unchecked by many remedial measures such that changes of environment could afford; and the buoyant adolescent of 18 had now become the weedy dyspeptic adult of 25.

Such are the common features of the early stages of failure in function of the alimentary tract in these individuals whose gross structural anomalies have been demonstrated upon the open abdomen. Further, it may be noted that they were not cases of primary constipation or of general visceroptosis. In only 28 of them had constipation preceded their other troubles, whilst its appearance was delayed in most of them until four or five years of suffering had been experienced.

The position of the viscera and their range of excursion were noted by the only precise method at our disposal—that is, when the abdomen had been opened with the patient in the horizontal position on the operating table. All of them had a prolapsed ascending colon, some of them had a partially prolapsed transverse colon and stomach, 95 of them had a right prolapsed kidney; but none of them had a prolapsed liver, spleen, pancreas, descending colon, or left kidney. To be quite precise, the left kidney was mobile and prolapsed in three of them.

A description of the individual variations in symptoms added on to the common symptomatology cannot be entered upon now, and it must be mentioned merely in passing that several of them had had renal crises with healthy kidneys and normal renal secretion, and had been suspected of harbouring renal calculi; others of them had had biliary crises with healthy gall bladders and healthy contents, and had been treated for gall stones.

Thirty-two of them had undergone "cures" for colitis, in some instances lasting as long as five years, whilst under the many diagnoses of duodenal ulcer, gastric ulcer, gastroptosis, gastralgia, gastric neurosis, neurasthenia, and psychasthenia the most ingenious changes of environment had failed to stay the course of their sufferings.

Of surgical measures that had proved ineffective before these patients came under my care, from 46 the appendix had

been removed, in 5 the gall bladder had been drained, in 9 a gastro-jejunostomy had been performed, and in 1 of them a gastroplication.

To summarize briefly the operative procedures performed upon these 210 cases: In all of them the ascending colon was fixed to the posterior abdominal wall in what approximated to the normal position. As additional measures the atrophic right half of the transverse colon was fixed by Coffey's method in 128 of them; the ventral mesentery of the gall bladder was cut away clean up to the free edge of the gastro-hepatic omentum in 76 of them; the gastro-jejunostomy union was resected and the stomach and jejunum restored to their normal isolation in 6 of them; gall stones incidentally found were removed and the gall bladder drained in 3 of them; and the gall bladder excised from 1 of them who had a permanent biliary fistula from a previous drainage operation done elsewhere.

The appendix, which was still present in 164 of them, was removed and was obviously diseased in 4 cases; whilst in the remainder it was strikingly small and healthy in appearance. In 2 cases ileal kinks were cut away. With regard to the "first and last kink" I was unable to differentiate it from the fascia covering the iliacus and obturator muscles on the left side, drawn out by a pendulous loop of iliac and pelvic colon that had retained its primitive mesentery. This condition was only present in 35 cases. Masses of adhesions from previous operations had frequently to be waded through before the final operation of reconstruction could be begun. There were four deaths from the operation in the total series of 518 cases; two of them have already been recorded in the original paper, while the third occurred in the series of cases now under review from post-operative pneumonia followed by an empyema that proved fatal on the seventeenth day after operation. The fourth—the only one that occurred in a child—was from diphtheria, for which tracheotomy had to be performed within thirty-six hours of the operation, but the patient died a few days later. The operative death rate is thus only a fraction of 1 per cent., and the operation of reconstruction of the alimentary tract may at least claim to range itself amongst the safest of surgical procedures.

Of late complications, in 8 cases attacks of intestinal obstruction from adhesions came under my notice during the last eleven years. In 6 of them a knuckle of small intestine was adherent to the under aspect of the laparotomy scar and in 2 of them the omentum was adherent to the floor of the pelvis. Thus the formation of adhesions as shown by their distribution was not peculiar to an operation for readjustment of the position of the colon and they appear to represent a very average risk of any interval abdominal operation.

The number of patients who had extensive peritoneal adhesions from previous operations before coming into my hands were 58. These adhesions were carefully undone before proceeding with the operation of reconstruction, and in estimating end-results have necessarily to be taken into account.

The results can only be presented to-day roughly in three groups—failures, improvements, and apparent cures. Twenty patients write to me that they are no better (in the space on the form that they are asked to fill in under the heading "Present condition," one of them writes laconically the single word "Rotten"), but they add that they are no worse!

There is an intermediate group who have lost a great many of their old troubles, and, whilst they are not entirely free from all symptoms, they say that their health has been materially improved, and are gratified by what has been achieved for them.

Whilst finally, as a set-off to these two groups, there are 98 who declare, after periods varying from eight to five years since the operation, that they are enjoying a degree of health that they had never previously experienced, and that they regard themselves as perfectly well.

Many enumerate in detail how they have passed from a life centered around the search for new remedies for their intestinal troubles to one of active participation in sport and work. The rate of improvement in their records is most variable and interesting: in some, a long climb uphill to a reasonable standard of health was in front of them, in others an abrupt and dramatic change for the better has occurred.

Two patients, both under 30 years of age at the time of operation, performed seven years and six years ago respectively, had been practically bedridden for one year beforehand. During the subsequent year they made a slow and steady improvement, at the end of which time they have entered upon a practically unbroken spell of buoyant health and have increased their weight by an average of 2½ st. apiece.

As a contrast, a young man of the severe hunger pain type, of two years' duration, estimates one year later that his progress is "pretty fair," adding incidentally that his weight in that time had gone up from 10 st. 1 lb to 12 st. 7 lb.

Such, then, is the brief picture of gross structural variations in the alimentary tract of 210 cases; of the clinical aspect of the functional disabilities of the alimentary tract from which they suffered; of the method, details, and risks of an operation of reconstruction undertaken to restore them to type (essentially conservative and physiological in its principles and not substituting an alternative pathological condition for the original one); and of the end-results that have been achieved.

The general principles involved in these studies must once more be referred to in conclusion. The whole philosophy and practice of medicine from time immemorial has regarded environmental factors as the cause of early stages of functional disability in the alimentary tract, and the question of whether pre-existing structural defects that have been present from birth have at last revealed their presence by an inevitable failure of function has seldom, if ever, been raised.

As the logical outcome of such a premiss, changes in environment have formed the basis of treatment, which comprises elaborate changes in the proportion of the proteid carbohydrate and fat elements of diet, and the administration of animal, vegetable, and mineral substances from a swollen pharmacopoeia.

With the failure of these measures to afford relief, fresh concepts of functional inefficiency in the endocrinic system, the autonomic nervous system, the central nervous system, and finally the psychic nervous system, have been evoked to explain the slow progressive breakdown of normal function in the alimentary tract, in spite of the environmental readjustments to which it has been exposed. That lesions of one or all of these systems should have caused patchy distribution of the deformities already enumerated seems unlikely; but that the structural deformities primarily present in such a case may have been responsible for a secondary involvement of these systems is not unthinkable, with the ultimate establishment of a vicious circle.

Now the perfectly developed alimentary tract can only have been one with a structure of enormous resistance to hostile factors in environment to have permitted the human race ever to survive. The incredibly filthy habits of the cave man with his uncooked, unanalysed, and unwashed food, his unwashed hands, his unclipped nails, his louse-infected body, and his ignorance of sanitation, would long ago have swept the human race from the face of the earth unless many of them had been adapted structurally to resist such an environment successfully.

This environment is faithfully reproduced in the homes and habits of slum dwellers of to-day. Yet from these same slums you may hale forth eupeptics, affording a contrast between the rude health they enjoy and their violation of all laws of sanitation and dietetics, that is an astounding testimony of the innocuousness to them of their environment.

The dyspeptics are there too, and in large numbers; but so also the eupeptics and dyspeptics abound in the teeming multitude of suburban dwellers and amongst the ranks of the wealthy and leisured classes. Than the last class perhaps none are brought up more strictly from childhood under the guidance of distinguished leaders of medical thought in the laws of dietetics—that is, amidst an environment for the alimentary tract in which function should be performed most efficiently and with the least exposure to the menace of hostile factors.

Nevertheless, in these three large social subdivisions of the human race whose environments are characterized by the most divergent elements, eupeptics and dyspeptics abound with a constancy both inexplicable and bewildering if variations in environment are to be regarded as the sole determinants of efficient or inefficient functioning of the alimentary tract.

This theory of the sole influence of environment clearly breaks down in the presence of such widely distributed phenomena of alimentary tracts defying the foulest environment with success, and succumbing ignominiously when sheltered by the fairest. Some other factor that determines so erratic a distribution of these ills must be taken into account, and I venture to suggest that that factor is represented by gross structural anomalies of the alimentary tract which are present from birth. For them no environment that is suitable has as yet been found; whilst in their absence it seems biologically true that no environment is unsuitable.

The exposure of the alimentary tract to the influence of gravity as the result of man's upright position has imposed upon it a strain unique in the animal world. Solid ingested material has to move against a resistance that can no longer be merely expressed in terms of the coefficient of friction between itself and the mucous membrane of the alimentary tract, since a vertical uphill path has to be traversed in part of its course against the tendency of its own weight to drop downwards. This tendency, moreover, is still active during the resting phase of the solid material, so that its full weight has to be supported with the minimum expenditure of energy and the force of expansion exerted upon the wall of the segment of gut that contains it appropriately overcome.

A structure efficient on the physical side for the purposes is likely to have been evolved and probably finds its best expression in a fixed ascending colon that has rotated to its appropriate position on the right side of the body. In the absence of such fixation the gut and its load must slip downwards, whilst the expansile force of the load will exert its maximum effort unchecked by the unsupported walls of the gut.

That atony and atrophy of its fatigued musculature should ensue over the areas where the strain is greatest is no matter for surprise in accordance with the physiological law of the effect of continuous stimulation. Not only would hypertrophy be utterly impossible under these conditions, but its occurrence would be so inexplicable as to need revision of these laws.

The involvement of the nerve terminals of the mesentery, at least to the extent of the production of pain, and the alteration of the venous exit of blood from the horizontal to the vertical direction through the vessels of the ascending colon, are additional factors probably in producing this condition and cannot be ignored; although the precise amount of their influence cannot as yet be demonstrated experimentally.

The effect of rest cures upon these patients prior to operation affords a study of great interest, since the common feature of all their cures was the removal of the patient from the position of the biped to that of the quadruped by permanent maintenance in the horizontal position. With very few exceptions all of them to the number of forty-six experienced great relief, and when the relief passed off on resumption of their ordinary life as a biped their faith was only slightly shaken in its efficacy of finally affording them a permanent cure.

A series of cures ultimately shattered their faith that by such means their viscera would be made to stay permanently in their normal positions, although such a promise could only have been made to them with a total ignorance of the structural lesions that were actually present in their alimentary tracts.

Ultimately 19 of them were persuaded to undergo rest cures in the Trendelenburg position—a mode of treatment whose pharmacological action can hardly be stated, but whose mechanical effect can be appraised with accuracy. Of necessity this method also failed and permanent relief was only obtained after a reconstruction operation upon the alimentary tract had been performed. But the flotsam and jetsam of spas, health resorts, and systems of cures are not cases at a stage when surgical measures as a last resource should be undertaken for them.

Such final chapters of pathology should never have been written, and they can merely be used to point the moral that the prevention of their occurrence by successful treatment in the earlier stages is the direction in which progress must travel. That I believe is the essence of the teaching of the distinguished opener of this discussion.

I have never performed a total colectomy or a short-circuiting operation and only two hemi-colectomies for non-malignant diseases of the colon; but to have done so upon the many cases upon whom I have refused to operate at all could not have added to their miseries, and I realize that I have abandoned them to the hopeless quest for relief by some other means.

By way of recompense for such an omission the boundless measure of thanks from those enumerated in this series, to whom reconstruction operations have restored so great an amount of health, should be gratefully offered as tribute to the pioneer, Sir Arbuthnot Lane, who has guided our thoughts in the direction of a search for procedures that may prevent the total and final débâcle of all alimentary tract functions.

III.—Sir HENRY M. W. GRAY, K.B.E., F.R.C.S.Edin.,

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In contributing to this discussion I propose to deal chiefly with developmental pericolonic adhesions, but in a very different way from Sir Arbuthnot Lane, as I disagree with him entirely with regard to their etiology. For many years they have been to me the most interesting of the non-malignant affections of the colon. Their developmental *origin* became evident to me very soon after I began to study them systematically. Their *effects* are still, in the opinion of many surgeons, problematical. The question of their *treatment* must therefore be considered to be very much in the melting-pot. I shall discuss only those found on the right side of the abdomen. They are the most frequent and the most frequently assertive in causing interference with normal health. It seems reasonably justifiable to believe that, so far as the functions of the colon as a whole are concerned, the first part, consisting of the caecum and ascending colon, is the most important, in that it makes the pace, so to speak, for the rest. If it is out of gear the rest of the colon will not work properly. Therefore, if abnormalities of this first part are found, it seems to me that it is one's duty to try to decide whether these abnormalities are actually causing or are likely to cause interference with health, and if so to settle what is the best way of correcting them. I believe that in most cases this will be attained by rearranging the parts in conformance with Nature's intention. Therefore it is essential to know the real process of development of these abnormalities. Abnormalities are so frequent that this becomes an important question if patients are not to be subjected to repeated operations, or if, in other words, they are to be restored to the most perfect attainable health by one operation.

One must not disregard other congenital adhesions which may affect the splenic and sigmoid flexures, sometimes in a very deleterious manner. Sir W. Arbuthnot Lane has devoted much attention to these adhesions, and he deserves very great credit for pointing out so well the evil effects of chronic intestinal stasis; but I venture to say, with all deference, that his theory that such adhesions are due to chronic constipation does not by any means sustain the acceptance which it obtained when he first enunciated it. He placed the cart before the horse. As I stated years ago, these adhesions may *lead* to constipation and may be aggravated by the inflammation which sometimes results from such constipation. According to Lane, the various abdominal bands of adhesions found at different parts are due to "crystallization of the lines of strain." This expression is difficult to comprehend, especially when one finds such bands already very evident in the foetus and in young children whose structures cannot have been subjected to any but the slightest strain, if indeed to any at all. The effect of strain on other intra-abdominal adhesions is usually to stretch them and promote their absorption. Such an independent observer as Bryant[1] of Boston found such bands present in some part of the abdomen in all the male foetuses he examined and in 87.5 per cent. of the female foetuses. It is interesting to hear that Mr. Chapple, a vigorous supporter of Sir Arbuthnot Lane, could find "no trace of bands similar to those present in the adult" in any of the foetuses he examined. From my experience of abdominal surgery in young children, I cannot believe that Bryant is very far wrong in his observations.

Ruthless sacrifice of the colon has not found general permanent favour in the minds of the profession, and I feel that the results of extensive colectomy in such cases have not improved the condition of my patients to a degree at all commensurate with the severity of the procedure. In only two out of eleven cases of removal of the major part of the colon in my private practice have the patients expressed themselves as being satisfied with the result of the operation.

The more one studies the interior of the abdomen and the attachments of the viscera to the parietes the more convinced does one become that any explanation of these abnormal arrangements which is not founded on the vagaries of development is not worth considering. One is, further, so much impressed with the frequency of their occurrence that one wonders why a description of their appearance does not find a place in the ordinary anatomy books.

Abnormalities in the mobility of the various parts of the colon are due chiefly to increase or decrease in the fusion of, or in the length of, the various folds of peritoneum formed in connexion with the development of this part of the bowel. Thus the mobility of the caecum and ascending colon is

chiefly dependent upon the extent and density of the fusion of the peritoneum lining the posterior aspect of the corresponding part of the mesocolon and of the colon itself with that lining the posterior abdominal wall. The height, fixity, and to a great extent the angulation of the hepatic and splenic flexures depend on the length of the right and left borders of the omentum which tack these flexures to the abdominal wall or adjacent viscera. Interference with motility as well as mobility may be caused by these slings and by the other developmental adhesions whose mode of formation I shall now discuss. These membranes are of little use as support to the bowel, although they may exert a deleterious kinking action. I shall deal chiefly with the so-called Jackson's membrane, but I feel that I may be excused if I include also the band known as Lane's terminal ileal membrane ("Lane's kink"), as the two are frequently associated. The reason for the frequency of the combination will, I hope, be made clear to you. I am greatly surprised to read Mr. Waugh's statement,[2] made in 1920, that he found Jackson's membrane only once in 180 cases. I find that it is present, to a greater or less extent, in the majority of patients in whom I open the abdomen.

As is well known, the caecum during development descends from the subhepatic region along the posterior abdominal wall to its usual situation in the iliac fossa. At first the lower end of the ileum and the ascending colon are provided with a long mesentery and mesocolon. During and after descent of the caecum these structures become blended or fused with the peritoneum lining the posterior abdominal wall so that the lower part of the ileal mesentery becomes quite short and the mesocolon as a separate entity disappears, while the colon itself frequently becomes "sessile."

Sometimes the caecum does not descend, and in these cases one may find that the lower end of the mesentery and the ileum have become plastered on to the posterior abdominal wall in the same way and in the same position as the mesocolon and ascending colon normally are arranged. If *delay* in descent of the caecum occurs, this adhesion of the mesentery and ileum may take place, so that when, later on, the caecum descends and of course pushes the ileum in front of it, the lower part of the ileum never becomes quite free from the posterior abdominal wall—a band, Lane's terminal ileal membrane, binds it back. This "band" may be several inches broad, it may be a continuous membrane or consist of one or more tags, or any gradation between these extremes may occur according to the amount of absorption of the abnormality which takes place in Nature's struggle to reach the normal anatomical arrangement. The membrane may reach the antimesenteric aspect of the ileum or be merely attached to the mesentery according as early fusion to the posterior wall has affected the whole of the posterior aspect of the ileum and mesentery or merely the mesentery alone. (Compare the "normal" arrangement of the colon and mesocolon.) It will easily be seen that this binding of the ileum, when the membrane reaches the antimesenteric border, produces a rotation of the ileum in its long axis when it is pushed down by the caecum. When the membrane is divided the ileum almost springs into its normal position. The explanation of the fact that the ileum sometimes enters the posterior aspect of the colon becomes clear in view of what I have said. The presence of retrocaecal or retrocolic peritoneal pouches and some retroperitoneal cysts is also easily explained.

The anatomy books at my disposal are unpleasingly vague about the parts of the *omentum* which are important for us to consider, both with regard to their arrangement and development. The omentum extends much farther to the right than is described in them and implicates the viscera in the north-west territory of the abdomen to an extent not even hinted at. Ordinarily the omentum is depicted as stopping short of the pylorus, whereas there is no distinct margin at its attachment, on the right, to the stomach or transverse colon. It blends with a membrane, often very distinct, which stretches from the transverse colon up over the pylorus and duodenum to the lesser omentum and gall bladder. To the right of the foramen of Winslow this membrane passes up frequently to the under surface of the liver and in practically all cases to the posterior abdominal wall just below that viscus.

The chief cause of non-descent of the caecum appears to be abnormal entanglement thereof by this right margin of the omentum, which becomes much more evident in these cases. If the caecum ultimately overcomes this obstruction to its descent the affected part of the omentum becomes drawn out into *Jackson's membrane*. This usually filmy structure, with its long linear vessels and occasional little islands of fat, has a very variable attachment above and externally, but can be traced below and internally usually to the anterior longitudinal band, where it ends in the same manner as the main part of the omentum does on the transverse colon. Curiously in the adult it does not often reach the caecum. A well-marked Jackson's membrane can always be shown to be directly continuous with the ordinary omentum. As the transverse colon is approached more and more fat is found in this membrane, so that there is no real line of demarcation. While the upper end of Jackson's membrane is usually attached more or less broadly, and sometimes quite low down, to the posterior abdominal wall below the liver, or may extend a little on to the adjacent under surface of the liver, I have seen several cases where the membrane arose chiefly from the under surface of the liver external to the gall bladder, and from the adjacent anterior abdominal wall as well. It is not to be wondered at that this membrane should vary in obliquity and in length and thickness at different parts, so much so that quite substantial bands may be present which may be so short as to interfere with the movements of the colon—that is, at any part it may be a direct cause of stasis because of the kinking which is caused. There is often quite a thick part attached to near the middle of the ascending colon. As already indicated, chronic irritation from absorption of toxic products may lead to further thickening of such pericolic membranes, and thus a vicious circle is produced. In this connexion I cannot understand why Sir Arbuthnot Lane should assume that a reaction from stasis should occur in one class of his cases and not in the other.

When the descent of the caecum is retarded by omental adhesions the appendix is usually implicated by them. In my opinion this is the usual cause of a retrocaecal or retrocolic position of the appendix. The appendix, before it leaves the subhepatic region, becomes caught up by the short margin of the omentum which connects it, usually near its terminal portion, to the posterior abdominal wall. Later, when the caecum descends and distends, the appendix lags behind and assumes a position posterior to the caecum and colon. In such an appendix there is usually evidence of chronic inflammation, especially near the tip, which is often hook-shaped, and the strands of Jackson's membrane in connexion with it are, as a rule, unusually fibrous in structure. When it is freed the anatomical arrangements are usually found to be normal, both as regards the origin of the appendix at the caecum and the appendicular vessels. It is rare to find a subhepatic appendix lying anterior to the caecum and colon. In such cases the appendix has not been caught in the toils of the omentum, although the caecum has usually descended imperfectly. It can be appreciated easily that the appendix, if it occupies a position internal to the caecum, may be caught up during the process of obliteration of the lower part of the mesentery and become more or less incorporated with the under layer of that structure. This is the real explanation, in my opinion, of Lane's "controlling appendix." Of course, in some cases the appendix becomes secondarily adherent to the under surface of the mesentery as the result of inflammation, but the two types of case can usually be easily distinguished.

I do not think it necessary to do more than mention the fact that the ascending colon and the beginning of the transverse colon sometimes become bound together by the omentum so that the arrangement is sometimes likened to the barrels of a shotgun. This abnormality is usually only part of a "complex." It is evident that all manner of variations in the ultimate anatomical arrangement of these bands and of the parts of the bowel affected by them are possible and indeed are found, but they can all be traced to deviations from the general process which I have described.

The counterpart of Jackson's membrane on the left side is usually very scanty, and does not reach far down the descending colon. Usually only a few scattered linear vessels are all the evidence of its presence. It rarely exists as a distinct membrane.

In papers published in 1912 and 1913, written in collaboration with Mr. William Anderson, I described most of the conditions drawn attention to by Mr. Waugh in his paper published in January, 1920. You will find, especially in our papers published in the *Lancet* in May, 1913, that the descriptions of the anatomical conditions and symptoms tally fairly accurately with those he has given. The European war interrupted my opportunities for observation, but I may say that both before and since the war my conclusions have inclined me to take up an attitude similar to his. In one respect my experience differs

from that of Mr. Waugh. I do not often find in my patients a true ascending mesocolon. There is practically always some evidence of attempted fusion with the posterior abdominal wall, although this may consist of only filmy, loose connective tissue. In my cases, also, there is always a more or less definite Jackson's membrane. This association indicates to me that subhepatic entanglement of the caecum by omentum has taken place which has delayed the descent of the caecum until the period has passed during which intra-abdominal adhesion normally takes place. A late descent of the caecum means that faulty fusion will probably occur. It is not surprising that in many such cases the abnormal drag of the late descending caecum and ascending colon acts upon the adjacent short right part of the omentum, and results, by reason of the continuity of the structure, in formation of a potentially constricting band running over the front part of the duodenum or pylorus. Such a band may well be continuous with the congenital fold of peritoneum which fairly frequently affects the cystic duct or gall bladder to a variable extent. This connexion affords the explanation of symptoms referred to these organs in the upper part of the abdomen.

We can now consider in a rational way the probable effects of such abnormalities, and I propose to deal with these very shortly. I believe that such abnormalities are present in a large number of people who are in apparently perfect health—that only in a minority of persons are there definite symptoms which have been ascribed to their presence.

For many years I have appreciated the necessity for opening the abdomen in such a manner that the whole cavity may be explored, even although the operation may have as its primary object the treatment of symptoms which have been ascribed to disease of only one organ—for example, to a chronically inflamed appendix. One cannot always diagnose accurately the conditions which may have provoked the appendicitis or which have resulted from repeated attacks, and I feel that these often cannot be investigated thoroughly or treated efficiently through such inadequate exposure as, for instance, is afforded by the still too favoured "gridiron" incision. In justice to my patients I have become accustomed to use an extensive paracentral incision, displacing the rectus muscle outwards.

As a result of such exposure I find in the majority of my patients that "abnormalities" occur at one or more parts of the colon. A caecum and ascending colon, abnormally mobile according to ordinary anatomical descriptions, is most frequently present. This is usually accompanied by a more or less well developed Jackson's membrane, and in a considerable number of cases by Lane's terminal ileal membrane as well. The variability of the first part of the colon and its attachments forces one to a consideration of the question as to how far deviations from the normal cause abdominal symptoms or affect the general health. The same question arises in connexion with the colon as a whole. It seems that the arrangement of the colon as depicted in anatomy books is really not often found by *x*-ray examination. For example, the transverse colon is found in ordinary cases at a much lower level than in formalin-hardened cadavera, or in most patients who have been carefully prepared for operation. Its height varies greatly with posture and with the amount and quality of its food content. It is extraordinary how frequently well-marked kinks and convolutions in abnormal places or apparently excessive angulations at the flexures occur, without any apparent effect on the regularity and completeness with which the colon and rectum are evacuated. On the other hand, it is remarkable that an apparently normal colon, as outlined by *x*-ray examination, is present so often in patients who are sufferers from chronic constipation. It would appear that *x*-ray examination is of value in such conditions only when it reveals distinct stasis. I believe that in the average case of constipation this is due to lesions in the upper part of the gastro-intestinal tract—in the stomach, gall bladder, and appendix—probably more frequently than it is due to fault in the colon. I am glad to find that these opinions, deduced from examinations made during operation, are supported by observations made at Duff House by Dr. Spriggs and Mr. Marxer. Of course, in many cases there can be no doubt that the colon is at fault and must be dealt with. I am sure that Mr. Waugh has done good service in urging attention to the possible effects of the drag of a heavily laden mobile caecum and ascending colon. There is no doubt in my mind that this is the cause in many cases in which the symptoms are referred to stomach, duodenum, gall bladder, or right flank, and in which these symptoms are capricious in their appearance and variable in their intensity according to the posture of the patient, his general fitness, the functioning of his bowels, etc. I think that the term "hypochondriacal" as applied to many such patients is by no means a misnomer, and that a large number of them can be relieved by operation. The beneficial results of dividing abnormal adhesions in connexion with the organs mentioned and of fixing the caecum and ascending colon bear out the correctness of this statement. The symptoms caused directly or indirectly by such bands often mimic those of other lesions with wonderful accuracy, until closer observation reveals their capriciousness and variability, as I have just indicated. As already pointed out in 1912, and confirmed by Mr. Waugh, lesions of other organs may actually exist, being secondary to such adhesions. The possibility of such a connexion should always be investigated, and colopexy should be done if the necessary indications are present. Mr. Anderson and I further pointed out in 1912–13 that these symptoms often begin within a few years after the patient has, owing to circumstances or choice, given up the ordinary physical activities of childhood and early youth, or has, in other words, begun to lead a more sedentary or confined life. We showed that symptoms begin with loss of tone, especially of the patient's abdominal muscles, and that they vary according to his general health or tone. His alimentary canal shares in this variability of tone. Ultimately, unless he can spare odd times and cash to spend in special institutions where he can be stimulated to "carry on," he tends to become more or less a chronic invalid of the type with which Sir Arbuthnot Lane has made us familiar.

I wish now to put before you a few further remarks concerning treatment. I believe that very few cases indeed call for extensive resections of the colon as has been advocated by Lane. In my opinion this is justified only when *x* rays have revealed unusual stasis in various parts of the colon and when exploration shows that the colon is unusually long, convoluted, kinked, hypertrophied, and affected by adhesions which probably interfere with its motility. In two such cases, already mentioned, I removed the ascending, transverse, and descending parts of the colon. The sigmoid colon was so long that I was able to make a new transverse and descending colon out of it. I fixed the closed proximal end of the sigmoid to the posterior abdominal wall under the liver and tacked the new splenic flexure over a broad area to the diaphragm on the outer side of the spleen. I implanted the cut end of the ileum close to the right extremity of the new transverse colon. I would here urge the importance of making the blind end of the colon, proximal to such an anastomosis, as short as possible. A long blind end is almost certain to cause trouble from dilatation, consequent stasis and dragging, even although attempts are made to get evacuation of the bowel several times a day. I may say that ten years after operation both these patients are now enjoying life, free from their old troubles, especially that of constipation. It is but just to say, however, that in one of them gastro-enterostomy was done, at the same sitting, for a well-marked duodenal ulcer.

In the more ordinary cases, however, the colon is not arranged in such a "snorl." One opens the abdomen in a patient who, for example, has complained of symptoms simulating those caused by gall stones or cholecystitis, or gastric or duodenal ulcer, or appendicitis, or such discomfort in the right flank that one suspects obstruction of the colon or renal affection. One finds no gall stones, no ulcer, no real renal abnormality. There are more or less strongly marked peritoneal bands affecting one or more of these organs in the way which has been described, and there are besides a mobile, dilated, or possibly hypertrophied caecum and a similarly affected ascending colon, which, when weighed down by contents, exert a drag on these bands. In such cases the appendix is practically always thickened and congested, possibly kinked and dilated, whether it occupies a fairly normal or a retrocolic or submesenteric position. Years ago one used merely to remove the appendix under these circumstances, but the results were frequently so unsatisfactory that one felt driven to do more. One then divided the peritoneal bands, but still the results were not all that could be desired, so that one proceeded farther, and, arguing from the fact that the mobile and distended caecum and ascending colon were not normal, one imitated Nature, and fixed the caecum and colon in the right iliac fossa and flank, as advocated by Wilms[3] in 1908 and, twelve years later, by Waugh. I have done this with increasing frequency since 1912, and, I am

bound to say, with increasing satisfaction. The good results of this operation have almost weaned me entirely from performing excision of the caecum and ascending colon for this condition. It seems to me that this part of the colon gives rise to most trouble, and that if it is fixed it will, in the great majority of cases, regain and maintain its proper rôle in the mechanism of digestion and absorption of food. So convinced have I become of the potential evil effects of mobile caecum and ascending colon that, if I find them present when I open the abdomen for any reason, I now fix them if the condition of the patient permits the extra expenditure of time, even though no symptoms ascribable to the condition have been present. It has become to me almost as "natural" a thing to do as to remove the appendix when the abdomen has been opened for other conditions.

In performing the operation I recommend that the filmy, fibro-fatty tissue at the back of the colon be removed or pushed aside so that the colon may form really firm adhesions to the posterior abdominal wall. Care should be taken that the subhepatic flexure be not unduly constricted or kinked by the upper sutures. The caecum and colon are usually also plicated, concertina-wise, in a longitudinal direction, by catching the anterior and external longitudinal bands in the fixation sutures, so as to narrow the circumference of the bowel.

I believe that this operation should be performed much more frequently than it is at present in order to avoid disappointments in the effort to regain thoroughly good health for our patients, and also in order to prevent development of the numerous ills which are attributed to auto-intoxication from absorption. We must remember that the abnormalities which I have discussed begin to assert their evil influence insidiously at a comparatively early age, that their effects often become aggravated after any serious illness, and that their presence can be fairly accurately diagnosed by a just consideration of the local symptoms, especially if the patient shows the narrow abdomen and rather broad pelvis which may be looked upon as being frequent concomitants.

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IV.—HERBERT J. PATERSON, C.B.E., M.Ch., M.A.,

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It is indeed a sign of the times that a subject should have been chosen for discussion in the Surgical Section of the British Medical Association which only a few years back was referred to in the medical press in such terms as "meddlesome and dangerous surgery," and "an unnecessary and unjustifiable operation." It seems, however, that the council of the Section, with that "canniness" which is appropriate to a meeting in the second city of the empire, have thought it wise to tread warily, and have camouflaged the discussion with the title of "The surgical treatment of non-malignant affections of the colon," when in reality they mean the surgical treatment of intestinal stasis, as is clear from the fact that they have selected the great advocate of this treatment to open the discussion.

Sir Arbuthnot Lane has been a pioneer in the subject of disorders of the colon, and has not escaped the fate of those who advocate revolutionary proposals. I remember when I was a student, a great surgeon and teacher was accustomed to hold up Sir Arbuthnot Lane as a terrible warning and example of a brilliant surgeon with a mental twist in regard to the treatment of fractures. In later times it has been assumed by many that the various kinks and other abnormalities described by him are the figments of disordered cerebration.

Sir Arbuthnot Lane has received much hostile criticism with characteristic imperturbability and indifference, and although for years he was as one crying in the wilderness many of those who came to curse have remained to bless.

There are still some who scoff at the idea that there is ever any necessity for surgical treatment in intestinal stasis, and maintain that medical treatment is all that is required. Of such I would say that such an attitude of mind is a tribute, not to the soundness of their judgement or the adequacy of their treatment, but rather an indication of the ease with which their consciences are satisfied.

In many cases the kinks described by Lane are so obvious that one wonders why we failed to recognize them, and, contrary to what has been said by Sir Henry Gray, it is difficult to believe that they are other than acquired.

Although we may not all follow Lane along the whole of the road he has travelled, we must admit that he has taught us the great truth, that toxaemia due to intestinal stasis may produce serious disorders in the working of the human organism. I say "may produce" advisedly, because there may in some cases be a very great degree of stasis without any *obvious* inconvenience or damage to the individual. In connexion with intestinal toxaemia we should not forget to associate with Lane a distinguished Scottish physician, one of the many alumni of the north who have come south. I refer to Dr. William Hunter, whose work on pernicious anaemia has proved so valuable and so suggestive.

I will deal very briefly with three points:

1. Is there any proof that intestinal stasis causes the symptoms alleged?
2. What are the indications for surgical treatment?
3. What surgical procedures may be employed?

1. *Is there any proof that intestinal stasis produces the symptoms alleged?*

I will deal very briefly with one point, to which attention has not been called before. In many cases of intestinal stasis the symptoms are mainly gastric—flatulence, distension, pain shortly after food, occasional vomiting, and in some cases even gastrostaxis—a clinical picture which formerly was regarded as diagnostic of gastric ulcer.

Examination of the gastric contents of these patients reveals almost always a total absence of free hydrochloric acid. Now, if the stasis be relieved by a short circuit, not only are the gastric symptoms improved, but in many cases there is a return of the secretion of free hydrochloric acid. This sequence is so frequent that I think we are justified in regarding it as strong proof of the interrelation of the gastric secretion and intestinal stasis. I think it is probable that the secretion of hydrochloric acid is inhibited by some toxin absorbed from the alimentary canal.

2. *What are the indications for surgical treatment?*

What degree of intestinal stasis requires surgical treatment? A rough and ready test is to give the patient a dose of charcoal and watch for its appearance in the stools. In the absence of definite evidence of a kink or of a diseased appendix I would not consider surgical treatment unless the appearance of the charcoal is delayed for at least four days (100 hours). While recognizing fully the valuable help which is given by a skilled radiologist, in these cases I do not attach too much importance to radiography, unless it be confirmed by the charcoal test. A dog should wag his own tail, but not the tail wag the dog. There is perhaps a tendency at the present time to rely so much on bacteriology, radiology, and other diagnostic methods, that they are allowed to outweigh and even contradict the deductions from clinical observation—in other words, the radiological tail is wagging the surgeon. The surgeon should wag his own tail.

3. *What surgical procedures may be employed?*

When there is evidence of definite kinks or obstruction by bands clearly surgical treatment is indicated. When the stasis is due to atony of the large bowel or a large mobile caecum, medical treatment should have had a prolonged and thorough trial and have failed before surgical treatment is considered. Of such cases in my experience there are few which cannot be relieved by medical and mechanical treatment. It is only in the severe and worst cases that surgical treatment is indicated. There are six surgical procedures which may be adopted:

1. Division of bands.
2. Ileo-sigmoidostomy.
3. Partial excision of the large bowel.
4. Total colectomy.
5. Fixation of the ascending colon.
6. Colonic exclusion.

1. In my experience division of bands is a most satisfactory operation provided the bands are not very extensive. The kinks are permanently relieved, and I have had a number of opportunities, when the abdomen has had to be reopened for other conditions, of proving that the bands are not re-formed. If the bands are extensive I consider that their division is a dangerous operation, apt to be followed by severe and dangerous post-operative ileus. In such cases the operation of colonic exclusion, to which I shall refer later, is preferable.

2. In my experience ileo-sigmoidostomy is an unsatisfactory operation. The results in some of the cases are brilliant, but in many faeces accumulate in masses in the short-circuited ascending and transverse colon, and give rise to pain and in some cases to toxaemia. I have performed this operation on 41 occasions, and in 20 of them I found it necessary later to remove the colon above the short circuit.

3. Partial colectomy, in which the divided ileum is anastomosed to the transverse colon, and the caecum, together with the ascending and half the transverse colon, is excised. I advocated this operation in a paper read before the Surgical Section at the Annual Meeting of the British Medical Association in 1913. The results of this operation, so far as the relief of symptoms is concerned, are excellent; but after a year or two one learnt that portions of small intestine were prone to become adherent to some of the many tags of ligatured omentum, and result in either acute or chronic intestinal obstruction. I have performed this operation 27 times, and in 6 of these cases an operation was necessary later for the relief of intestinal obstruction.

4. I have never performed a primary total colectomy for intestinal stasis. In my judgement the operation is inadvisable for the same reason as partial colectomy—namely, the danger from the adhesions of intestine to the tags of omentum. Of the 20 patients on whom I had to perform total colectomy subsequent to ileo-sigmoidostomy, 6 later on had intestinal obstruction, 5 were operated on and recovered, and 1 died without operation, out of reach of speedy surgical treatment. Until we discover some means of preventing adhesions I think we must regard total colectomy as an operation the remote risks of which are too great to permit of its use in the treatment of intestinal stasis.

5. Fixation of the ascending colon has been discussed so fully by Mr. Waugh that I need not dwell on it. My personal experience of it is limited to two cases. It is not without its difficulties and its danger, and I confess from what I have seen and heard that I am sceptical of its value.

6. After the war I began to perform what may be termed colonic exclusion for severe cases of colonic atony and kinks caused by bands too extensive for safe division. So far as I am aware this operation has not been advocated before for intestinal stasis. The technique of the operation is as follows.

Technique of Colonic Exclusion.

Incision in middle-line three and a half inches long. Ligature and divide mesentery and terminal ileum for distance of one and a half inches, four to six inches from ileo-caecal valve.

Crush ileum at this interval with powerful crushing clamp. Tie two catgut ligatures round ileum, one at each extremity of the crushed portion.

Divide the intestine between the two ligatures with the actual cautery. Leave catgut ligature on distal portion of ileum long, cut catgut ligature close on proximal portion. The stump of distal portion of ileum is invaginated by a peritoneal purse-string suture.

The proximal portion of ileum is now anastomosed laterally to the sigmoid colon. The stump of the ileum is inverted by a peritoneal thread suture, commencing at the mesenteric border half an inch from the end of anastomosis and continued diagonally to such a degree that the end of ileum is flush with distal extremity of the anastomosis. In this way no projection of the blind end is left.

The sigmoid mesocolon is ligatured and divided for a distance of two inches, one inch above the anastomosis. The sigmoid colon is crushed in the portion separated from its mesocolon. Two catgut ligatures are tied round the crushed intestine one at each extremity of the crushed portion. The intestine is divided between the two ligatures by the actual cautery. The stump at one end of the divided colon is then buried by a peritoneal thread suture, passed diagonally, commencing at the mesocolic border, one inch from the end of stump. The gap between the mesosigmoid and mesentery of ileum at site of anastomosis is closed by a continuous thread peritoneal suture.

The appendix is brought out through a stab wound in the linea semilunaris, and secured to the edges of the skin by two sutures. The appendix is cut off just above level of skin and a large catheter passed into caecum and tied in.

If the appendix has been removed previously the caecum is brought into the stab wound and secured to the skin by two sutures and a catheter tied in.

I have performed this operation on nineteen occasions. One patient died from the operation sixteen days later from suppuration in the right iliac fossa, the cause of which was not obvious. Of the remaining 18 patients the result has been excellent in 16. One patient has had from time to time slight attacks of pain apparently due to distension of the caecum with gas, as the pain is relieved by passing a catheter into the opening of the ileum. One patient died eighteen months subsequent to operation from chronic perforation of stercorous ulcer resulting in a large intra-abdominal abscess.

This operation, it appears to me, has all the advantages and none of the drawbacks of total colectomy. It is a less severe operation than total excision of the colon; the mortality rate should not be more than 2 or 3 per cent.; nothing is removed; but above all there are no raw surfaces or tags left behind to lead to intestinal obstruction later. I venture to think that it is an operation which merits trial in those severe cases of intestinal obstruction which do not yield to medical treatment.

Magna est veritas et praevalebit. I believe that time will confirm the truth of the principles which Lane has taught us, although more knowledge may modify the methods of treatment he has advocated with such brilliance and enthusiasm.

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[*Abstract.*]

Mr. A. J. Walton said that he had no fixed views on the question; his disagreements with Sir W. Arbuthnot Lane were on small points in detail and not on the main principles. His first point was that these kinks and bands were not so frequent or so common as had been suggested. In the next place they were mostly congenital: he found bands and membranes in quite young children. The symptoms of that intestinal disturbance were present clinically in women chiefly (he thought 80 per cent. were women), but the bands and membranes were equally common in males and females. As to ptosis, the position was that if 50 per cent. of people were born with membranes or bands those without ptosis had no symptoms, those who developed ptosis presented symptoms. Many women who had had frequent pregnancies had profound degree of ptosis but no symptoms. He thought that they were finding the development of visceroptosis much more commonly in young women now than formerly, and the explanation was that in muscular development young women were approximating much more to the male type than to the female, and that the more muscular they became the more apt was the formation of visceroptosis. He reminded them of Sherrington's theories as to the two muscular groups: static or involuntary, and the voluntary. Young women to day were neglecting their static muscles. In regard to the relation between this condition of intestinal stasis to secondary lesions of the intestinal canal his view was that ptosis or stasis was in no way the cause of duodenal ulcer or gall stones. Only 10 per cent. of his 500 cases of duodenal ulcer or gall stones presented stasis, and over 70 per cent. of his cases of gastric or duodenal ulcer were in males, whereas 80 per cent. of his operations for stasis were in females. Stasis was not the cause of gastric ulcer, though it closely resembled it in symptoms. There was no relief to stasis, in his view, in removal of appendix or fixation of caecum. In regard to treatment, operation should not be performed in early cases of stasis. It was a medical disease, and operation should be performed only if medical treatment had absolutely failed and only in very advanced cases. Most of these cases of stasis gave rise to symptoms various in their effects, resembling gall stones or chronic appendix or gastric ulcer, and they had to make accurate differential diagnosis between these conditions. He limited fixation of viscera to cases in which the symptoms were confined to those viscera.

THE OPERATIVE TREATMENT OF DIFFICULT HERNIAS.

BY

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Surgeon to the London Hospital.

Of the many problems which arise in dealing with a difficult hernia perhaps the most important is that of closing the aperture securely and permanently. For this purpose the normal supporting tissues of the region may be unavailable, either having entirely atrophied or being so thin and delicate as to tear on the first attempt at suture and to be quite useless for repair. Overlapping operations are severe in execution and necessarily involve serious distortion of the abdominal wall, whilst the difficulty of the procedure is increased by encroachment on the abdominal cavity. In some cases the difficulty had been overcome by the introduction of perforated plates of celluloid or aluminium, and the wire filigrees of McGavin have achieved conspicuous success. These methods, however, involve the introduction of a foreign body which can never in any sense be assimilated by the

tissues. The ideal solution of the problem demands some material which, whilst it is not absorbed, is so far assimilated by the tissues as to become an integral part of them, providing a scaffolding around which fibrous tissue may be laid down, but preventing the stretching to which such tissue is liable. I believe that we possess such a body in mercurialized silk.

This material was introduced by Lange some fifteen years ago for the construction of artificial tendons and ligaments. He directed that thick floss silk should be boiled for an hour in 1 in 1000 mercury perchloride, in order thoroughly to impregnate it with the salt. It was then dried and kept in sterile parolein, in which the salt is insoluble. The resulting material is hard and wiry, and I find it a great advantage to substitute mercury biniodide for the perchloride. As drying the silk under aseptic conditions is troublesome I transfer it for dehydration to a 1 in 1000 solution of biniodide in absolute alcohol, from which it is finally transferred to sterile parolein. Silk thus treated is perfectly soft and flexible, whilst it retains its full tensile strength. When introduced into the tissues it sets up no irritation, and it has the curious property that although it is not absorbed it is so absolutely assimilated that the resulting structure is a close imitation of normal tendon or aponeurosis, possessing, however, the great advantage that it will never stretch. Microscopic sections show the strands of silk impregnated with fibrous tissue cells, the whole forming substantially a single structure.

The method of darning hernias was, I believe, first suggested by Sampson Handley in 1918, and I can only attribute the limited use which has been made of it to the absence of a suitable material. The facility with which ordinary silk may become infected is notorious, and the introduction into the tissues of the many yards which may be required involves considerable risks, for if it should become infected its removal is a serious matter. In any case plain silk is in many cases not assimilated by the tissues, and we have all found knots of silk ligatures encysted in old wounds. I have now used mercurialized silk for several years, and in no case have I seen any sign of irritation, nor has it ever been necessary to remove the silk.

The closure of hernial orifices by this method is exceedingly simple. If a peritoneal sac existed the margins are drawn together, care being taken, if necessary, to retain a portion of the sac sufficient for the purpose. The method we are describing is quite satisfactory in the case of landslide hernias in which no true peritoneal sac exists. The surrounding tissues are so far defined as to provide an adequate attachment, and the opening in the muscular abdominal wall is now darned by means of interlacing strands of silk, running from side to side of the aperture, through the margins of which they pass. These strands are so arranged as to form a net with meshes perhaps a quarter of an inch square, every opportunity being taken to bury the strands in any tissue which may be available. No attempt is made to close the aperture by dragging the sides of the opening into apposition, only such tension being applied as will bring the margins to their normal anatomical position. It will usually be possible to cover the net with some remnant of the fibromuscular structures of the wall, but if this is impossible a substantial covering of skin and subcutaneous fat will suffice. In most cases of this description the latter tissue at least will be present in sufficient quantity.

I have closed very large apertures by this method, a defect six inches in diameter being in one case filled. The advantages of the method are its extreme facility, the avoidance of extensive dissection and of traction, with a resulting absence of shock, its applicability to every conceivable form of hernia, and the security of the result. A remarkable feature is the normal appearance of the abdominal wall. After several months the aperture has become so perfectly obliterated that in more than one case it has been difficult to convince oneself that it ever existed.

From a series of large hernias so treated I should like to describe two as typical of the results one may expect to obtain:

CASE I.

A woman of 55 had six years previously been operated upon at another hospital, a large ventral hernia resulting. For five days she had had severe abdominal colic, vomiting, and absolute constipation. She was a very stout woman, with a gigantic, tense, irreducible ventral hernia. On operating, two large sacs were opened containing large and small gut, the latter distended and obstructed. With a good deal of difficulty the gut was freed and returned, and the peritoneum closed. There was a gap of fully six inches between the recti, the wall consisting of scarcely more than skin and peritoneum, with a little fat between. The whole space was darned in the manner described. Seven months later there was a sound abdominal wall between the recti. There was no sign of a hernia, she was in perfect health, and had no discomfort of any kind.

CASE II.

A man of 64 had a gigantic bilateral inguinal hernia of ten years' standing. The scrotum hung down almost to his knees, and as he was a vagrant it will be understood that he was not an attractive surgical risk. Under spinal anaesthesia the hernias were reduced by open operation, the chief difficulty in reduction being the lack of room in the abdominal cavity to accommodate the contents. The sacs were closed in the usual way, and the large apertures remaining in the abdominal wall darned with mercurialized silk, no attempt being made to bring the margins into actual approximation. The man made a normal recovery, and five months later he was perfectly well and the abdominal wall was absolutely sound.

These cases are merely illustrations of a method of wide application. It is difficult to imagine a hernia which could not by these means be brought under control.

THE BACTERIA OF THE TONSILS AND ADENOIDS.

BY

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THE results recorded in this paper were based on an examination of the tonsils and adenoids removed by operation on children under 16 years of age at the out-patient department of the Royal Hospital for Sick Children and the school clinics.

The specimens were collected by the observer, and examination was begun generally within one hour of collection. All the specimens showed hyperplasia, but no evidence of acute inflammatory or any other special pathological conditions visible to the naked eye. The object of the investigation was to determine the bacterial flora of the tonsils and adenoids in ordinary hyperplasia, and to estimate the frequency with which they are infected by *B. tuberculosis*.

A culture was first made from the surface, then, after cauterization with a hot scalpel, a second culture was made from the bottom of the crypts by means of the platinum loop.

Cultures were made on (1) nasgar slopes, (2) nasgar smeared with human blood, and (3) blood serum slopes. The remainder of the specimen was then minced as fine as possible with scissors, pounded in sterile normal saline and completely macerated. This mixture was treated with 33 per cent. antiformin and incubated for two hours at 37° C., centrifuged for half an hour, and the supernatant fluid poured off. Sterile saline was next added and centrifuged again. This process was repeated two or three times to eliminate all traces of antiformin. The fluid was then inoculated subcutaneously into the groin of a guinea-pig. At the end of six weeks the animal was killed and examined for enlargement of glands at the site of inoculation, for any other glandular enlargement, and for evidence of *B. tuberculosis* in these glands or in any of the organs. Films were made from the enlarged glands and stained by the Ziehl-Neelsen method and examined for acid-fast bacilli. Sections in paraffin were made from the remainder of the glands and examined for any evidence of infection with *B. tuberculosis*. If nodules were found to be present in any organ they were also examined histologically.

Bacillus tuberculosis.

The inoculations made from tonsils or adenoids numbered 170 (120 patients). Three of these inoculations revealed the presence of *B. tuberculosis*; in each case the examination was tonsillar, and the examination of the adenoids gave a negative result. The percentage of positive cases was 2.5. In the positive cases there was no clinical evidence or history of tuberculosis.

Forty-three adenoids and 37 tonsils were examined for other bacteria with the following results.

Diphtheroids.

Blood serum was used as the culture medium, and films from these cultures were stained with methylene blue, Neisser's stain, and Gram's stain. Bacilli which were Gram-positive and which showed the presence of granules with Neisser's stain and with methylene blue were classified as diphtheroids. The pathogenicity was tested in many cases by inoculations into guinea-pigs. None

of those tested were pathogenic to these animals. Diphtheroids were present in 30 per cent. of the cases. They were obtained from the superficial surface of 24 per cent. of the tonsils and 9 per cent. of the adenoids, and from the depths of the crypts of 15 per cent. of the tonsils and 11 per cent. of the adenoids.

Streptococci.

Nasgar smeared with human blood was used as the culture medium. The colonies were examined with reference to the following properties: solubility in bile, fermentation of inulin, and haemolysing power. They were all insoluble in bile and did not ferment inulin. The haemolytic property was tested by direct examination of the plate and again by adding a pure broth culture of the streptococcus to the washed red blood cells of the sheep. They were classified according as they gave complete haemolysis, partial haemolysis, or no haemolysis.

Group I was found in 84 per cent. of the cases, and was obtained from the superficial surface of 37 per cent. of the tonsils and 11 per cent. of the adenoids, and from the depth of the crypts of 89 per cent. of the tonsils and 58 per cent. of the adenoids.

Group II was found in 34 per cent. of the cases, and was obtained from the superficial surface of 13 per cent. of the tonsils and 9 per cent. of the adenoids, and from the depths of the crypts of 16 per cent. of the tonsils and 27 per cent. of the adenoids.

Group III was found in 92 per cent. of the cases, and was obtained from the superficial surface of 75 per cent. of the tonsils and 90 per cent. of the adenoids, and from the depths of the crypts of 64 per cent. of the tonsils and 67 per cent. of the adenoids.

The streptococci giving complete haemolysis were more frequently present in the depths of the crypts of the tonsils and adenoids than on the surface. This strain is usually considered to be the most pathogenic, hence the removal of this organism by swabbing alone is difficult, and its appearance on swab culture would be relatively infrequent. Streptococci giving no haemolysis are of frequent occurrence, being present in nearly all the specimens examined.

Pneumococci.

Nasgar smeared with human blood was used as the culture medium. The colonies were examined as regards bile solubility, haemolytic properties, or inulin fermentation. They were found to be bile-soluble and capable of fermenting inulin, and showed no power of haemolysis. They were not classified further. Pneumococci were present in 56 per cent. of the cases, and were obtained from the superficial surface of 46 per cent. of the tonsils and 44 per cent. of the adenoids, and from the depths of the crypts of 40 per cent. of the tonsils and 41 per cent. of the adenoids.

B influenzae (Pfeiffer's Bacillus).

Nasgar smeared with human blood was used as the culture medium. Small greyish-white colonies were found in some cases. Film examination showed that these consisted of short Gram-negative bacilli. They showed no power of haemolysis, and were considered to be the *B. influenzae*. They were present in 18 per cent. of the cases and were obtained from the superficial surface of 10 per cent. of the tonsils and 13 per cent. of the adenoids, and from the depths of the crypts of 8 per cent. of the tonsils and 9 per cent. of the adenoids. It was further noticed that those colonies present were usually adjacent to the more closely packed colonies of streptococci.

Dr. Shri Kent, working independently in this laboratory, made similar observations. At the time of examination the city was free from an epidemic, hence normally the *B. influenzae* does not frequently inhabit the tonsils and adenoids of children.

Meningococcus.

Nasgar smeared with human blood was used as the culture medium. Minute transparent colonies were obtained in a few cases which, on examination by a Gram-stained film, had the appearance of meningococci. They were further inoculated into sugars, and gave acid in glucose and maltose, but did not ferment galactose and saccharose. Subcultures on nasgar showed no growth. These colonies were considered to be meningococci and were found in 8 per cent. of the cases. They were obtained from the superficial surface of 5 per cent. of the tonsils and 2 per cent. of the adenoids, and from the depths of the crypts of 5 per cent. of the tonsils and 2 per cent. of the adenoids. Hence the meningococcus is rarely present and is a more frequent inhabitant of the tonsils than of the adenoids.

Bacillus coli.

Nasgar was used as the culture medium. The greyish-white colonies were subcultured on to bile salt, neutral red lactose agar, red colonies being formed. They were further examined as regards motility, production of indol, and fermentation of certain sugars. They were found to be motile and produced indol. They gave acid and gas in lactose, saccharose, maltose, glucose, and mannite, and acid and clot in litmus milk. They were considered to be *B. coli communis*, and were present in 8 per cent. of the cases. The bacillus was never obtained from the adenoids. It was obtained from the superficial surface of 10 per cent. of the tonsils and from the depths of the crypts of 6 per cent. of the tonsils.

The remaining organisms found were *Micrococcus catarrhalis*, *Staphylococcus aureus*, *Staphylococcus albus*, *Micrococcus flavus*, *Pharyngeus siccus*. They were classified by means of their cultural characteristics, Gram stain, and fermentation of sugars.

Micrococcus catarrhalis was present in 94 per cent. of the cases, and was obtained from the superficial surface of 97 per cent. of the tonsils and 90 per cent. of the adenoids, and from the depths of the crypts of 64 per cent. of the tonsils and 72 per cent. of the adenoids.

Staphylococcus aureus was present in 56 per cent. of the cases, and was obtained from the superficial surface of 54 per cent. of the tonsils and 41 per cent. of the adenoids, and from the depths of the crypts of 27 per cent. of the tonsils and 16 per cent. of the adenoids.

Staphylococcus albus was present in 50 per cent. of the cases, and was obtained from the superficial surface of 35 per cent. of the tonsils and 11 per cent. of the adenoids, and from the depths of the crypts of 16 per cent. of the tonsils and 11 per cent. of the adenoids.

Micrococcus flavus was present in 66 per cent. of the cases, and was obtained from the superficial surface of 43 per cent. of the tonsils and 44 per cent. of the adenoids, and from the depths of the crypts of 24 per cent. of the tonsils and 30 per cent. of the adenoids.

Pharyngeus siccus was present in 28 per cent. of the cases, and was obtained from the superficial surface of 10 per cent. of the tonsils and 23 per cent. of the adenoids, and from the depths of the crypts of 11 per cent. of the adenoids.

It was observed that in every case fewer colonies were obtained from the adenoids than from the tonsils, and fewer varieties of organisms.

The observer wishes to express her indebtedness to Professor Beattie, in whose laboratories the work was done, to Mr. Leathart, honorary surgeon to the Children's Royal Infirmary, to Mr. Courtenay Yorke, honorary surgeon to the Northern Hospital, and to Mr. Horace Mather, honorary surgeon to the Birkenhead Children's Hospital, for their kindness in placing specimens at her disposal.

THE CLINICAL THERMOMETER IN THE PREVENTION OF PULMONARY TUBERCULOSIS.

BY

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Disease as we see it in great hospitals is, in a majority of the cases, incurable. To go forward we must go back—behind the physical signs which, until recently, have been almost the sole criteria of disease, to the realms of early symptoms, whose importance the pioneer work of Sir James Mackenzie is impressing upon discerning minds. To no disease do these principles apply with greater force than to pulmonary tuberculosis.

Much thought and ingenuity have been expended upon the problem of how to scotch the invader before it has had time and opportunity to pass our defensive systems and entrench itself in the pulmonary tissues. The stethoscope, even in the ears of the expert, has had to go. To realize its impotence to detect the first inroads of the disease we need but to remember that the lung may be the seat of an extensive pneumococcic infiltration without producing physical signs, if the disease be deeply placed.

Unfortunately, efforts in other directions have introduced elements of risk without eliminating uncertainty. My purpose is to urge the claims of the clinical thermometer, *understood and properly used.*

At the outset let me emphasize two elementary facts: (1) a distinctive characteristic of active tuberculous infiltration is fever of varying degree; (2) the vast majority of civilized persons is infected with the disease at some period, commonly in early life.

It appears reasonable, therefore, to assume that a very large number of cases of anomalous feverish attacks both in children and adults are due to infection by the tubercle bacillus. How often do such cases occur in the experience of every medical man! Fever, headache, nausea, malaise, perhaps some cough; no physical signs: diagnosis, "? influenza"—a word probably responsible for more deaths than the disease itself—or "an anomalous feverish attack due to some toxin." The commonest, the universal toxin is that of tubercle. It is argued that the patient recovers in a week, and that tubercle is a chronic, persistent affection. But does the patient recover in a week, and is tuberculosis so obstinate in its first manifestations? If it were the whole population would be in bed. Tubercle is, perhaps, of all diseases the most amenable to treatment in the great majority of cases, if promptly recognized and dealt with. But what it lacks in initial severity it compensates for by subtlety. It can appear in many guises, and may relax its grip sufficiently to convey the impression that the illness is over; but each successive attack is a little more obstinate than its predecessor, each intervening period of comparative health a little more difficult of attainment, until suddenly comes the knock-out blow and the ensuing struggle, either hopeless from the start, or resulting, at best, in comparative restoration of health after a weary fight of months or years. This tragedy the thermometer,

rightly used, would have prevented, by demonstrating the slight persistent fever, and thereby ensuring rest.

In cases of illness the thermometer is in great measure the final court of appeal, but by misusage the instrument is prevented from affording the help of which it would otherwise be capable.

In the first place, ignorance obtains as to what constitutes a normal temperature; and secondly, the means adopted to register the body heat are inadequate. The normal temperature is almost always assumed to be 98.4° F., but a record normal at one period of the twenty-four hours or under one set of conditions would be subnormal or supernormal at another time or in other circumstances.

The late Sir G. Sims Woodhead, in collaboration with Dr. Varrier-Jones, carried out a large number of experiments in continuous rectal readings in both healthy and tuberculous persons. The records are of the first importance, though the technique is too complex for use by the general practitioner. In his report Professor Woodhead referred in several places to the teaching contained in Dr. S. Vere Pearson's paper on "The temperature as a guide to the treatment and prognosis of phthisis," which appeared in the *Lancet* of September 18th, 1909. That paper contains matter of very great value, and a real grasp of the essential points regarding the various types of temperature curve would give the practitioner a good working knowledge of the right use and interpretation of the thermometer.

I reproduce, by permission, Dr. Pearson's diagram illustrating the four principal types of curve that may be met with.

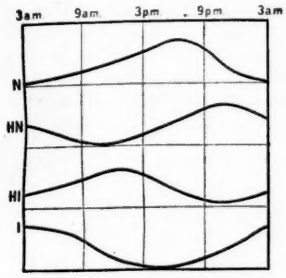

Chart representing Normal (N), Half-Normal (HN), Half-Inverse (HI), and Inverse (I) types of temperature curves respectively.

For the purpose of this paper it is sufficient to draw attention to the N curve, which is that found in the vast majority of normal persons. In the event of his meeting with one of the other three or any variation of them the practitioner should investigate further. It will be noticed that the lowest point of the normal curve is reached at about 3 a.m. and the highest somewhere about 6 p.m. The curve is representative of temperatures taken after rest. Without going into the differences in the normal points obtaining in different persons I think it may be stated that the morning temperature before rising should be below 98° F. and the 6 p.m. reading not above 98.6° after thirty minutes' rest.

One or two variations which may be regarded as normal are as follows: In women during the week or ten days preceding menstruation there is usually a rise of several tenths. This disappears either with the commencement of the flow or a day or two later. Exercise raises the body heat from 1° to 2° F. in proportion to the energy expended. In young children a certain amount of latitude may be allowed, their heat-regulating centres being imperfectly developed. This must not blind us, however, to the fact that, while slight causes will upset a child's temperature, we have no guarantee in a given case, without definite signs to account for the rise, that the cause is slight. Any persistent rise should be noted carefully and appropriate steps taken. Childhood is beyond all other periods that in which tuberculosis makes its first attack.

Lastly, in this connexion, there is no law in medicine, and a few persons with early lung disease have consistently subnormal temperatures.* There are many complexities concerned in accurate temperature readings, but the broad outline given should enable the practitioner to safeguard his patients' health.

Finally, we must deal with the method to be adopted if the actual body temperature is to be accurately determined.

The procedure adopted practically without exception, outside of sanatoriums, is to place a thermometer in a patient's mouth, axilla, or a groin, and after a couple of minutes to pronounce a result of 98.4° as normal—and this without regard to the time of day. It is true that in a case of marked fever any of these crude methods will give a rough idea of the actual temperature, and the higher the fever the nearer will such readings approximate to the truth. But in such cases strict accuracy is not of vital importance. It is immaterial whether the temperature of a feverish patient be 102° or 103°. What is of paramount importance is that we should know whether it has dropped to within normal limits with the subsidence of the more obvious symptoms of the illness. It is here that the methods in vogue completely fail to enlighten us. In slight rises of temperature it is necessary to keep a mouth thermometer in position for anything from fifteen to thirty minutes in order to obtain the best record the oral method is capable of yielding, especially in a cold room, and even so the actual body temperature is not obtained. In spite of these facts these two-minute records of 98.4° or thereabouts are being accepted as normal temperatures every day by virtually the whole of the medical profession.

Pulmonary tuberculosis is manifested in its earliest inroads by a feeling merely of being below par, together with a slight degree of fever, which, under present conditions, goes unrecognized.

There is one way by which these slight rises may be registered, and that is by rectal readings. Whatever the external temperature, an accurate record is obtained by a three minutes' insertion. All the temperatures given above as falling within the normal variations are records of rectal readings. The objections to the method are entirely negligible, and I have never found them to persist for twenty-four hours, even in the most sensitive and fastidious patients. Until this method is in general use we shall continue to "get upon their feet again" patients who ought to be on their backs, and who, under such conditions, would quickly and permanently restore the balance, with an increased resistance and immunity, but who, under our present illogical system, are having prepared for them a harvest of sorrow, to be reaped in months or years to come.

* Since writing this I have had the advantage of Dr. Vere Pearson's criticism. With the exception of this statement he has expressed approval of all I have written. These low temperatures he is inclined to look upon as suggestive of arrested disease, in the same way that one gets subnormal readings temporarily after pneumonia. At any rate they should serve to keep the question of tubercle in the practitioner's mind. For this reason I have not deleted the sentence.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ACUTE PROCTITIS CAUSING GENERAL PERITONITIS AND DEATH.

THE following unusual case of general peritonitis and death recently came under my care whilst in clinical charge at the Oldham Borough Fever Hospital.

A woman, aged 35, was sent in as a case of scarlet fever as she was said to have had a rash, but on admission no rash was present, nor were there any signs of scarlet fever. She had, however, signs of inflammatory trouble in the left iliac fossa, with a temperature of 100° and a pulse of 100. Next day she was very much worse, and a surgeon and gynaecologist were called in. General peritonitis had developed rapidly, with all the usual signs, and one considered that an infected Fallopian tube was probably the *fons et origo mali*. A vaginal examination failed to reveal any very definite tumour nor any definite tenderness. Rectal examination, however, did reveal a tender area, high up anteriorly, and the original diagnosis was adhered to, on the strength of this, failing a better one.

No operation was performed, as the patient was too ill, and next day she died; a *post-mortem* operation was performed in order to elucidate matters, with the following result.

General sero-purulent peritonitis was present, with much fluid in Douglas's pouch; no specially intense inflammatory focus was observed to guide one to the cause of the trouble, and a careful examination of the hollow viscera, for possible perforation, was undertaken, but with a negative result. No other focus was discovered which might account for the trouble, either in the pelvis, abdomen, or thorax, until, as a last resort, Douglas's pouch was opened and the rectum opened out to inspection. The musculature of the rectum was acutely inflamed throughout its whole length, and was infiltrated with yellow pus. There was no sign of abscess formation, rectal or peri-anal, and the peritonitis was apparently due to contiguity rather than to perforation, of which there was no sign. There was no sign of haemorrhoids, fistula, or diverticulae to account for the condition, and it was strange that the patient never complained of any rectal pain or discomfort of any sort, even upon defaecation, and a rectal examination had entirely failed to suggest a proctitis. The inspection of the rectum left no doubt that the peritonitis was secondary to the proctitis, and not vice versa.

My thanks are due to Dr. Godson, of Oldham, for his help in the elucidation of this case.

W. H. DU PRÉ, M.B., B.S.Lond.,
Late Assistant M.O.H. for Oldham.

St. Just, Cornwall.

FIBROIDS COMPLICATING SEPTIC ABORTION.

THE following case, of multiple fibroids complicating a septic abortion, appears to be worthy of record.

H. L., aged 39 years, a laundrywoman, had been married six months; she was well developed and gave no previous history of any serious illness. She complained of constant griping pains in the lower abdomen accompanied by haemorrhage from the vagina. She had had amenorrhoea for three months; previous catamenia were regular but profuse, lasting six days. She said that her abdomen had enlarged during the last year; she had had difficulty with her urine for six weeks, and latterly incontinence. Pain and vaginal discharge had lasted four days, and the pain was getting very much worse.

Two pints of urine were withdrawn from the bladder, and a large, smooth, solid tumour was found reaching to the lower border of the ribs, extending three inches above the umbilicus. Per vaginam a similar tumour filled up Douglas's pouch and was intimately connected with the first tumour. The os uteri was not palpable; the vagina was elongated and pulled up anteriorly, and there was a stinking vaginal discharge. It was not possible to disimpact the posterior tumour from the pelvis. The patient's pulse rate was 112, and her temperature 99°. She was removed to Oakham Cottage Hospital, and as it did not seem possible to empty the uterus and leave it uninfected, I decided to remove the whole uterus, clamping the os in a bag of vagina, as in panhysterectomy for malignant cervix. The patient made an uneventful recovery. The mass weighed 10 lb. 11 oz.; the long axis of the cavity was upwards and forwards with a very much elongated cervix.

F. HERBERT WALLACE, F.R.C.S.Edin.,
Uppingham. GEOFFREY WILSON, M.R.C.S.

Reports of Societies.

PHYSIOLOGICAL EFFECTS OF LIGHT.

AT a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on November 14th, a discussion took place on "The physiological effects of light." The President, Dr. W. LANGDON BROWN, was in the chair.

Sir WILLIAM BAYLISS, in introducing the subject, said that everyone was familiar with the fundamental law that light did not produce any effect unless it was absorbed by the medium through which it passed. It appeared in all the biological reactions so far investigated that energy from the light was absorbed, in some cases largely (as in the green chlorophyll of plants) and in other cases much less obviously. There were cases in which the light did not appear to impart much energy, and yet it might suffice to give the original stimulus for the starting of a process. In speaking of effects of the light he thought it more convenient, though possibly less accurate, to refer to them as photo-chemical effects (resulting in the production of some active chemical substance), rather than photo-electrical effects (in which the process was supposed to depend upon the emission of electrons). It was perfectly clear, especially from the observations on rickets and tubercle, that light acting on the skin produced something which must pass into the blood and be carried through the whole body. An important question which arose in this connexion was that of pigment. Was the function of pigment to absorb a particular wave-length of light? Did it act as a sensitizer? Hess of New York had shown that black rats were much less easily cured of rickets by light than white rats. If it were true that it was vitamin A which was concerned in the cure of rickets, it seemed pretty obvious that it ought to be possible to replace vitamin A by light. This replacement could take place to a partial extent. An animal on insufficient vitamin A could, by the action of light, grow as well as if it had a sufficiency of vitamin, but the converse of this did not hold good: by giving sufficient vitamin A rickets could not be cured in a dog kept without light. Another possible aspect of the light effect on tissues and structures must not be forgotten—namely, that the light rays passing through the skin became converted into heat rays in the blood.

Professor LEONARD HILL spoke chiefly on the question of pigmentation. The evaporative power of the skin was conditioned largely by pigment. It was the pigment layer which made the skin of the negro better able to lose heat than the skin of the white man. The sweat glands also appeared to be more active in the black skin. He related some experiments on the effect of pigmentation under sun heat, which showed that this took place better on wet than on dry skin, probably owing to the deeper penetration of the ultra-violet rays; it occurred less well in skin exposed to currents of wind, and very imperfectly in skin covered by glass. From observations on children it appeared that it was the cooling power, not the sun, which had the greatest effect on the metabolism, though the sun had a profound effect also. The speaker had confirmed Hess in every respect as to the effect of light upon rickets. By means of light, rickety changes in the bone could be stopped altogether, without very much improvement in growth, and the animals exposed to light were also healthier looking and with a cleaner skin. Phosphorus in the blood, which was very low in the rickety subject, was increased a little—not very much—by exposure to light. A fact which might appear puzzling was that children in some tropical or subtropical countries got rickets. This was probably explained by the effect of excessive temperatures. Rats living in moist heat on a normal diet showed signs of rickets and a tendency to die of pneumonia.

Sir HENRY GAUVAIN gave illustrations of the effect of light treatment in cases of surgical tuberculosis at the Alton Cripples' Home and at Hayling Island. One difficulty he had experienced was due to the non-pigmentation of certain children. Children with a tendency to freckle and not to pigment failed to do well under light treatment, and could not indeed stand long exposures to the sun. The absence of pigmenting power was of prognostic significance. Frequently there was latent tuberculosis in such children, and a new lesion might be expected to develop or an old one to recur. When this relapse did take place the children often acquired pigmenting power and thus became more amenable to treatment. Sun treatment should not be given to children without proper arrangements to avoid blistering, and the children, by means of occupations and amusements, should have their attention diverted from the fact that they were receiving a course of treatment. The strong exposure to the light obtainable by the seashore at Hayling Island was not suitable for very young or very weakly children. It should be reserved for the stronger or those with good pigmenting power.

Professor C. J. MARTIN summarized the results of certain observations by the workers at the Kinderklinik in Vienna, which showed that in winter, among children on ordinary diet, not arranged to include a certain amount of the required vitamin, a considerable proportion developed rickets, whereas in summer the diet did not signify, for neither the children who had no cod-liver oil nor those who had it tended to get rickets. He thought that the discovery of the power of light in preventing and curing rickets was one of the most important of recent years.

Dr. ELSIE DALYELL described the treatment of rickets by mercury-vapour lamps, beginning with an exposure of five minutes daily at a distance of 100 cm., and gradually increasing the time and diminishing the distance until an exposure of thirty minutes was given daily at a distance of 70 cm. The first signs of healing in the case illustrated appeared on the seventeenth day, by which time the child had had a total exposure to the light of 1 hour 50 minutes. After a total exposure of 4½ hours, spread over seven or eight weeks, an *x*-ray photograph showed a restoration of the contour of the bone and apparently normal calcification proceeding.

Dr. GOLDBLATT of the Lister Institute described how animals had been put on a diet deficient in fat-soluble A, and after they had definitely stopped growing for two weeks they were irradiated by light, with the result that there was a temporary resumption of growth. His conclusion was that no synthesis of fat-soluble A occurred as a result of the radiation, but that a kind of economy of the fat-soluble already stored in the animal took place owing to the light action, and that this led to a better curve only for as long as the vitamin lasted.

Dr. W. CRAMER also gave an account of experiments on animals which went to show that the effect of light was really a physiological stimulus to the mechanism which formed the platelets or blood-plates. The nature of this mechanism was not known, but if the assumption could be made that the platelets were formed in the endothelium one could understand why the light acted as it did.

At the end of the meeting a paper on a cognate subject was read by Dr. J. W. TREVAN, in which Miss E. Boock had collaborated. It gave an account of experiments on colour changes in frogs under the action of light. It was easy to turn a frog from dark black to yellow in the course of a few hours. The frog that had been exposed to light was definitely more susceptible to digitalis and to the group of which digitalis was a member than the frog which had been kept in the dark. Frogs which had been kept in the light were more susceptible also to quinine. It was possible that

in the mammal there was some such mechanism as that which produced colour changes in the frog; there might be nervous receptors in the skin as well as in the eye which were affected by light, and which influenced in some way the metabolism of the whole animal.

TUBERCULOSIS OF THE FEMALE PELVIC ORGANS.

THE Obstetrical Section of the Royal Academy of Medicine in Ireland met on November 3rd, with Sir WILLIAM SMYLY in the chair, when the President, Dr. BETHEL SOLOMONS, read his presidential address on "Tuberculosis of the female pelvic organs." Having referred to the diagnosis and treatment of tuberculosis of the vulva and vagina, he dwelt on the possibility of infection of male by female and vice versa. The difficulty of making a diagnosis between cancer and tuberculosis of the cervix was sometimes great, and much care must be exercised by the pathologist when making his report. Tuberculosis of the body of the uterus was found as a tumorous condition or in the form of endometritis, these types were commonly associated with tuberculous salpingitis. Tuberculosis of the Fallopian tubes might be regarded as one of the common ailments among women. Dr. Solomons had sent a questionnaire to a series of 54 cases on whom he had operated, and from the answers obtained he concluded that resection of the tubes in these cases was undesirable; that complete salpingectomy was the treatment of choice; and that hysterectomy was unnecessary except when the uterus was greatly enlarged or in a state of pyometra. For abdominal tuberculosis operation was considered the best treatment; occasionally post-operative *x* rays or vaccines were of benefit; but the treatment by *x* rays or vaccines in operable cases, or where a diagnosis had not been made definitely, was to be deprecated. The difficulty in making a definite diagnosis in cases where there was much intestinal involvement was sometimes extremely great.

Sir WILLIAM WHEELER said that he would like to thank the President and members of the Section for inviting him as President of the Surgical Section to hear a most interesting address. Tuberculous peritonitis was a very common malady, and, in the first instance at any rate, the patient consulted either a surgeon or a physician, yet in the majority of cases in females the primary focus was in the Fallopian tubes. It was interesting to note how tuberculous peritonitis arose from the Fallopian tubes, for it threw a bright light on the whole subject. In gonococcal and all infections of the tubes, except tuberculous infection, the fimbriated extremities were closed and the peritoneal cavity was safe from direct invasion; but in tuberculous infection the fimbriated extremities remained open, and the tubes spued their contents into the abdominal cavity, setting up tuberculous peritonitis. As a matter of fact, the fluid developed in the peritoneum was probably protective and defensive fluid, such as occurred early in perforated ulcers, and the real tuberculous peritonitis came on much later if the *fons et origo* was not removed. In the ascitic form, when the abdomen was opened and the fluid removed, the open ends of the tubes were closed by becoming adherent to some neighbouring viscus, and the peritonitis disappeared. The tubes then developed into pus tubes, and could be recognized as large pelvic masses, or else after years they disappeared and left behind a mass of adhesions fixing the pelvic organs. Murphy and Mayo had long ago proved those generally accepted facts. In cases of tuberculous peritonitis a certain cure could be predicted if tuberculous Fallopian tubes, or any other primary focus such as the appendix, could be removed. Adhesions appeared to occur in cases of tuberculosis in the pelvis without mixed infection, but the adhesive variety of tuberculous peritonitis above this level was always due to the entrance into the area of pyogenic organisms. These organisms were destroyed early, but the tubercle bacilli remained. Sir William Wheeler thought that the prognosis of tuberculous peritonitis depended almost entirely upon whether the primary focus could be removed. If it was not found or could not be removed the patient might recover for a time, but would succumb to tuberculosis within a few years. It was sometimes very difficult to distinguish between tuberculous peritonitis and the rupture of a small carcinomatous ovarian cyst. It was a curious thing that tuberculous peritonitis was found clinically twice as often in females as in males, but *post-mortem* examinations indicated the reverse to be the case. This was an illustration of the difference between the pathology of the living and the pathology of the dead, and an example of why clinical pathologists were needed who were interested in the living as well as in the dead. As regards operation in cases of tuberculous peritonitis, the difficulty was to decide whether the inside of the Fallopian tube was tuberculous or not. Tuberculosis on the outside was no indication for removal, for this might be part of the general spread of the disease, from a caseating gland or elsewhere. In many other abdominal lesions the work of the surgeon and the gynaecologist overlapped. Active tuberculosis became more active and destructive during pregnancy, as distinct from quiescent or latent tuberculosis, which was not affected. In conclusion, he said that they were backward in Dublin, as compared with other cities, in connexion with team work.

Dr. T. G. MOORHEAD said he felt at a disadvantage as compared with other speakers inasmuch as they were able to consider from a local standpoint, whereas it was only the general aspect which appealed to him and to most physicians. He was struck by the fact that Dr. Solomons had stated in his paper that the acquiring of mild tuberculosis early in life prevented that person from getting severe tuberculosis later on. The same thing was found in connexion with pulmonary tuberculosis. Paterson, in discussing the subject at the recent Annual Meeting of the British Medical Association, pointed out that old tuberculous lesions were rare in people who died of phthisis. This confirmed Dr. Moorhead's opinion that the best thing that could happen to children was to get a mild infection of bovine tuberculosis as early as possible. The only misfortune was that one could not control the degree of infection. As regards tuberculous peritonitis, he was glad to learn, from the remarks of the previous speakers, that surgical treatment was now practically abandoned. In his opinion, the only justification for surgery was to remove some local lesion, such as the Fallopian tubes. The idea that opening the abdomen, letting out fluid, and stirring up the contents produced cure was quite a mistake. Medical treatment gave far better results than surgical. Occasionally tuberculosis of the Fallopian tubes came before the physician as a cause of unexplained pyrexia. In such cases the diagnosis rested with the gynaecologist. Tuberculin tests, whether hypodermic or cutaneous, were quite unreliable.

Dr. W. D. O'KELLY remarked that in dealing with tuberculosis of the tubes certain points arose. In a so-called primary case of tuberculosis how did the disease get into the tubes? The tubes were not at all liable to injury. Why were they so frequently involved? With regard to the tuberculosis of the ovary, a case of this was brought to him by a surgeon, who operated for tumour of the ovary, and when shown to him it looked like a cancerous tumour of the peritoneum. He would like to know if the President had met with any cases of tuberculosis of the uterus developing after pregnancy.

Dr. GIBBON FITZGIBBON said that he had hoped to receive some information on the treatment of tuberculous disease. Sir William Wheeler was of opinion that the tubes should always be removed, but on that subject he had an open mind. He generally based his treatment on the individual case, according to whether he thought the case was one in which tuberculosis had been cured, or one in which it was active. One practically never diagnosed a case as being one of tuberculosis of the tubes. The question of operation held out in the paper that night seemed very drastic. Tuberculosis of the uterus was rare, as shown by the number of cases in which the uterus was taken away and found to be non-tuberculous. The majority of tuberculous tubes met were cases studded over on the surface. The paper that evening had been extremely interesting, and it was very valuable to them to hear the remarks of the physicians and surgeons on a subject with which they had to deal a good deal.

Dr. R. J. ROWLETTE remarked on the rarity of tuberculous disease of the uterus, at any rate as compared with tuberculosis of the tubes. He used to think that infection by coitus must be an event that occurred with a certain amount of frequency, but he could never find any evidence to support this. Though one got a good result as regards cure by operation, yet there were a great many people who had not been operated on, who recovered from the disease and lived healthy lives afterwards. The President had spoken of the rarity of tuberculosis of the ovary, but he had no suggestions to make as to why it was so rare.

Sir WILLIAM SMYLY said that what struck him most was that the remarks made were not a mere repetition of what one found in textbooks, but were in a great many cases opposed to textbook teaching. He hoped it had given a death-blow to the Alexander-Adams operation. One often operated for retroversion, and found tuberculosis in the pelvis, which could not be diagnosed. He would like to know, in connexion with operation for tuberculosis of the tubes, if there were very dense adhesions was it worth going on and risking faecal fistula?

Sir ANDREW HORNE congratulated the president on his paper, and also on the idea, which emanated from him, of asking surgeons and physicians to attend the meeting. It was a very happy augury for the Academy of Medicine.

Dr. BETHEL SOLOMONS, in reply, agreed with Sir W. Smyly that tuberculosis of the tubes was a striking argument against the Alexander-Adams operation. He (Dr. Solomons) had opened the abdomen of several women suffering from tubal disease on whom this operation had been performed. It was regrettable that an operation which had been practically given up in most countries was still extensively indulged in in Dublin, to the detriment of patients. While tuberculous tubes should be removed when possible, in some cases adhesions were extensive and the operator must then consider whether the dangers of large raw areas, faecal fistulae, and haemorrhage were not greater than the danger of leaving the tubes *in situ*. Of course the tubes often shelled out quite easily. Tuberculous tubes varied, but usually they were closed at the abdominal ostia. Drainage was not carried out except when oozing was intractable, and then by gauze through the posterior fornix. The question whether labour should be induced for a woman who was four months pregnant and suffering from a tuberculous knee was difficult and could not be decided on generally; the individual case would require much consideration. Dr. Moorhead had raised the question of pasteurization of milk; he had himself seen so many fatal cases in infant clinics when the milk had not been pasteurized that he was a strong advocate of pasteurization—the supreme argument for it was the inability to control the dose of tubercle bacilli. According to the literature of the present time complement fixation tests were of little value. Tuberculosis seldom affected the body of the uterus, because of the constant movement with menstruation. The tubes were affected most commonly because of the small diameter of the ostia and many plicae. The prime reason why most of his patients with tuberculous tubes consulted him was for the cure of sterility.

LIFE HISTORY OF THE SANDFLY.

A LABORATORY meeting of the Royal Society of Tropical Medicine and Hygiene was held at the London School of Tropical Medicine, Endsleigh Gardens, on November 15th, when a number of interesting demonstrations were given.

Squadron-Leader H. E. WHITTINGHAM, R.A.F.M.S., detailed the life history of the sandfly, *Phlebotomus*, and demonstrated methods of maintaining these insects in captivity, illustrating his remarks by a large number of specimens. He said that in the summer of 1921 the Royal Air Force Sandfly Fever Commission commenced its investigations. Researches carried out that year showed that a small percentage of so-called "sandfly fever" cases harboured in their blood stream a leptospira, morphologically indistinguishable from *Leptospira ictero-haemorrhagiae*. The simple nature of the disease was in question, as most of the cases from which the leptospira was isolated were accompanied by a relatively severe type of fever and some even developed jaundice. It was decided that the only feasible way to attack the problem was to endeavour to establish definitely the mode of transmission of sandfly fever and to reproduce it in an area free from that fever. Formerly many points in the etiology of this disease had been, without full confirmation, accepted as correct. The phlebotomus, rightly accused of transmitting the disease, had never had its life history fully elucidated, nor had it ever been bred in captivity from ovum to imago. It was first necessary, therefore, to restudy the habits of phlebotomi and to attempt to rear those flies in captivity; the latter was accomplished during last summer in Malta, and several hundreds of the flies had now been bred through to maturity.

From a close study of the natural habits and habitats of the phlebotomus, confirmed by experiments, it was found that the imago hatched out between sunset and dawn, usually between midnight and 4 a.m., when the atmospheric humidity was about 90 to 100 per cent. The wings were first crumpled up and held horizontally, but dried in the course of a few hours, the period depending on the amount of moisture in the air. When dry, the wings were raised almost vertically over the body and the insect was able to fly. By this time the mouth parts were hardened, and a blood feed was taken within the first twenty-four hours of adult life.

The ovum measured 0.385 mm. in length by 0.12 mm. in breadth, was brown in colour and sausage-like in outline, convex dorsally and concave ventrally. Eight days after oviposition the transversely segmented embryo could be seen through the egg-shell; on the ninth day the outline of the embryo was more marked and the caudal bristles were distinct. Usually the larva hatched out within a few hours of the caudal bristles becoming clearly visible; just prior to the hatching a slight side-to-side rolling motion of the ovum was observed. Four distinct stages were found in the larval life, with a complete moult between each. Immediately after each moult the larva was pearly white, except for the brown coloration of its mouth parts and the black pigmentation of its caudal bristles. The head and body darkened within two hours, by which time the larva was moving freely and feeding voraciously. The whole larval life was completed in four weeks. Pupation occurred between the twenty-fifth and twenty-eighth days of larval life, the pupa emerging from the dorsum of the first and second body segments of the larva. The discarded larval skin enveloped the two distal segments of the pupal body like a wrinkled stocking, and was clearly recognized by the yellow body hairs and two pairs of black caudal bristles. The duration of pupal life was usually nine days.

Special boxes were constructed to breed the phlebotomi in captivity, made of wood with a front of glass. A tightly fitting aluminium tray was fitted to the bottom of each box to prevent moisture being absorbed by the wood. The actual breeding grounds were constructed from small pieces of Maltese limestone varying in size from that of a peanut to that of a walnut, with imported garden earth or ordinary Maltese earth, and nitrogenous organic matter in the form of the faeces of lizards, crushed insects, or dried human blood. Before being placed in the boxes all these constituents were sterilized for two hours at 140° C. Water was added to each box daily after sunset, sufficient to moisten the lower levels of the mounds; the exact amount varied with the stage of the life cycle. For oviposition the soil was kept well moistened; during the non-motile stages of development (maturation of the ovum and pupal life) less moisture was added, but in the motile stage (larval life) more water was added as the larvae could move about and select a level with the necessary amount of moisture. The cages were kept in baby incubators at a temperature of 80° F. In this manner three generations of flies were reared.

Colonel A. ALCOCK, F.R.S., demonstrated Mansonia larvae, termites' nests, etc.; Colonel S. P. JAMES, the eggs of some English culicines; Dr. P. H. MANSON-BAHR, a case of *Filaria loa* infection, and also the ulcerative condition of the intestine in sprue; Dr. A. C. STEVENSON, the cycle of *Filaria loa* in *Chrysops dimidiata* (as elucidated by Dr. A. Connal and Mrs. S. L. Connal); Mr. CECIL HOARE, the life cycle of *Trypanosoma melophagium* in the sheep, the sheep ked, and in cultures; Dr. J. G. THOMSON and Dr. A. ROBERTSON, stages in the development of *Trypanosoma cruzi* in experimental animals; and Lieut.-Colonel H. MARRIAN PERRY, developmental stages of *Bulinus contortus*, the invertebrate host of *Schistosoma haematobium*.

MILK CONTROL AND DISTRIBUTION IN AMERICA.

A MEETING of the Society of Medical Officers of Health was held at 1, Upper Montague Street, Russell Square, on November 17th, with the President, Dr. T. EUSTACE HILL, in the chair.

Professor JOHN ROBERTSON read a paper on the American milk supply, its control and distribution. He said that he had recently paid a visit to the United States for the purpose of obtaining at first hand a knowledge of the methods adopted in that country in connexion with the production and distribution of milk. He was accompanied by an English dairy farmer and a representative of the great milk distributors, so that he was able to obtain from American farmers much fuller information than if he had been alone. He visited nearly a hundred farms and also investigated the

town supplies. The conclusion he arrived at was that the milk supply in American towns was enormously better than in England. As a general rule it was richer, cleaner, had better keeping qualities, and was freer from the possibility of conveying scarlet fever, typhoid fever, or tuberculosis. There was a feeling among the people that the supply was a safe one. The general principles adopted to bring this about were that the supply was of good quality, all vessels were sterilized and well dried before use, the udders were cleaned, covered milking pails were used, and cleanliness was enforced. The farmer was paid for his supply on a fat basis. If the monthly average of samples taken daily was above 3.5 per cent. he received increased payment; if below he was paid less. It paid, therefore, to produce good milk. A great deal of milk was distributed in bottles, which were stoppered with a disc indicating the day of the week on which the milk was produced. The cost of production had not been materially raised by the improved methods of production, and the consumption of milk in America was about double that in England. Professor Robertson referred to the effect of pasteurization on milk and considered that the extra cost entailed by adopting this process might be met by a reorganization of the methods of distribution.

The PRESIDENT said that in the northern counties of England no attempts were made at pasteurization except in one or two large towns. He pointed out that the vitamins in dried milk were not destroyed by sterilizing, and urged that dirty, ill-constructed cowsheds had a demoralizing effect on the workers. Dr. T. EVANS thought there would be great difficulty in using sterilizers in many English farms. Professor KENWOOD said that there was at the present time being sold in England a large amount of pasteurized milk, which was distributed in bottles at the same price as raw milk. There was only one delivery daily, thus reducing the cost of distribution. Dr. HOWARTH suggested that there was no waste to the retailer who sold milk in bottles. He believed that the milk produced in England by the big combines was as good as American milk.

Dr. W. BUTLER thought it was a pity to contemplate a milk supply which required sophistication. If milk were produced in a cleanly condition there was little to fear from its consumption. We must have a milk that is initially clean, and not forget that contamination could be effected in the house. These views were supported by Dr. HERBERT JONES, Dr. C. S. THOMSON, and Dr. F. J. H. COUTTS, the last of whom agreed that, though the ideal to be aimed at was to produce clean milk, this could only be attained by increasing its price to the consumer; he certainly did not like the idea of sterilizing dirty milk.

A MEETING of the Bath Clinical Society was held at the Royal United Hospital on November 3rd. Mr. LACE showed a specimen of a neuroma of the plantar nerve removed from a case of intractable metatarsalgia which was cured by this procedure. Dr. COATES showed two cases of dysentery, one of which showed an infection with bovine tubercle added to the dysenteric infection. Mr. FRASER showed a case of painful foot with a calcanean spur; a case of epithelioma of the tongue, and one of suppurative dacryocystitis cured by operation from the nose. Dr. GORDON showed a case of congenital dislocation of the hip in a man of 66, and a case of infantilism in a girl aged 17½. Mr. MUMFORD showed two cases of congenital dislocation of the hip in children. Mr. LEVIS, in a paper on the treatment of varicose ulcer, mentioned the various methods of treatment usually in vogue, and described his own method, which he has found very satisfactory. This consists in (1) compresses of strong solution of sodium bicarbonate for a few days. (2) The limb is elevated for half an hour to two hours and painted from knee to toes, regardless of the size of the ulcer, with a solution of crystal violet and brilliant green 1 to 2 per cent. When the stain is thoroughly dry two or three ordinary 3-inch bandages well soaked in Unna's paste are applied. This may have to be repeated two or three times in the first ten days, then every three weeks to three months. The last bandage to be worn six to twelve months.

THE seventeenth annual conference of the All-India Sub-Assistant Surgeons' Association will be held at Indore (Central India) in December, 1922.

THE next meeting of the International Union Against Tuberculosis will be held at Berne, Switzerland, in 1924. It is proposed that the meeting in 1926 shall be held in the United States, under the presidency of Dr. Theobald Smith, director of the Rockefeller Foundation Animal Research Laboratory at Princeton.

Reviews.

OLD AGE.

SIR HUMPHRY ROLLESTON has turned his Linacre lecture given this year at St. John's College, Cambridge, into a very interesting book, compact of matter but yet easy to read. The lectureship is one of the oldest medical foundations in England, for it dates from 1524, six years after Henry VIII granted a charter to the Royal College of Physicians, with Linacre as its first president. The lectureship has recently undergone a process not dissimilar to that biologists term rejuvenescence, of which the author has a good deal to say in several of the early chapters of his book.

The title is *Some Medical Aspects of Old Age*,[1] and in the first chapter the duration of life is considered in a general way; this is followed by a brief description of the onset of old age in man, and by discussions of the factors influencing longevity and of the causes of senescence. This part of the book is illustrated by portraits of a number of persons reputed to have attained great age. The author is properly sceptical as to the facts in the majority of the extreme instances, but his last portrait is that of Sir Henry Pitman, who was born in 1808, was for thirty-one years Registrar of the Royal College of Physicians, and died in 1908, a few months after he had become a centenarian. He was a remarkable example of the retention of mental powers into old age. Only a few years before his death and long after he had resigned the registrarship, which he did in 1889 at the age of 82, he went down to the college and made a speech as clearly delivered, as well put together, and as closely reasoned as in his best days; but it was an effort for which he had carefully nursed himself; in the most vigorous aged persons fatigue is quickly produced. Upon this Sir Humphry Rolleston has a good deal to say in several places, but particularly in the chapter on the physiology of old age, which we would particularly commend to the attention of the younger members of the profession, who naturally find it difficult to realize how the whole of an old man's life, even if he be free from any distinct manifestations of disease, is coloured not only by the slowly growing physical disabilities, but also by the decline of the power of making any continued mental effort. The inevitable loss may be hastened by psychical causes. "As the years advance and the younger generation come up the suggestion that 'his day is done,' that he has had his innings, and that it is time for him to step aside, is made to the senior not only by his family and his juniors—hetero-suggestion—but by himself, and he may then, after the modern fashion, get into the habit of repeating mentally 'I am getting older and older every day.'" This very true observation leads on to a consideration of the injurious effect giving up work may have. In a "healthy vigorous man enforced retirement at the age of 65 or 70 is not to the advantage of either the retiring victim or the community."

Healthy—"ay, there's the rub." Sir Humphry Rolleston devotes his last chapters to the distinction between healthy and morbid old age. "Violent death in one form or another—traumatic or infective—is," he says, "so much the rule that the occurrence of natural death in the animal kingdom has been questioned." The pathology of the aged includes the damage done in the past, perhaps in youth, as well as morbid processes starting during advanced life; the author enumerates these and discusses most of the more important and frequent. When considering the influence of personal habits on longevity, diet, alcohol, and tobacco come under impartial review. While he is emphatic that there can be no reasonable doubt about the bad influence on longevity of alcohol, even in moderate amount, he rather leaves the reader with the impression that his prolonged study of the subject has brought him to the conclusion that overeating is even more injurious; it is at least significant that the life histories of centenarians show that they have usually been small eaters, especially of meat, and Lacassagne's aphorism is quoted that "the greatest dangers for an old man are a good cook and a young wife." Tobacco is dismissed with the Scottish verdict—"not proven."

Scattered through the book are many shrewd pieces of worldly wisdom; for instance, "as a kind of protest against the inevitable there may, in the early stage of old age, be a

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[1] *Some Medical Aspects of Old Age.* By Sir Humphry Rolleston, K.C.B., M.D., President of the Royal College of Physicians of London. London: Macmillan and Co. 1922. (Cr. 8vo, pp. 175; 9 plates. 6s. net.)

tendency to ape the young and to conceal the true age; thus a man may remove the date of his birth from *Who's Who* and books of reference, and a mother may delay the coming out of her daughter." We find incidentally also some instructive clinical observations; for example, the reader is advised to bear in mind that the use of thyroid and other gland extracts having a definite effect on metabolism is not devoid of risk to cells that are gradually undergoing involution; for by stimulating metabolism unduly vitality may be exhausted, and a flash in the pan be followed by more rapid loss of function. Again it is said that "migraine usually becomes less troublesome or disappears with the march of years." Sir William Jenner, who often comforted sufferers from this distressing malady with an assurance to this effect, associated its disappearance with the decline in the activity of the sexual glands.

We have said enough to show that the book is a valuable contribution to clinical medicine, and we will repeat that it will be particularly helpful to young practitioners.

FRACTURES AND DISLOCATIONS.

THE third edition of Professor HELFERICH'S treatise on fractures and dislocations was considered to be of such interest as to warrant the issue of a translation by the New Sydenham Society. The tenth German edition[2] has recently appeared and in its general arrangement conforms to that of its predecessors. There is a good deal of new material based in large measure on experience gained in the great war. The method of nail extension introduced by Steinmann with several modifications by other authorities receives favourable notice. The operative treatment of fractures in general is referred to in relation to most types, though little attempt is made to give a detailed description of methods of technique. It is also noticeable that the use of bone grafts or pegs is not referred to.

The attitude towards the treatment of fractures of the neck of the femur, in contrast to that adopted by several American and French authors, may be classified as pessimistic, though no doubt pessimism in this relationship may be deemed justifiable by many experienced surgeons.

A number of new figures have been introduced. They are chiefly radiograms, and include a useful series showing the appearance of normal joints. Most of the old coloured plates are retained, and though they appear somewhat old-fashioned they give a very clear presentation of the anatomy of various injuries. The book endeavours to cover the subject in a very complete manner, and goes so far as to include the various forms of internal derangement of the knee-joint. This encyclopaedic character in a work, compressed as it is into little over 450 pages, detracts from the practical value of the volume, for it of necessity leads to the omission of many details of methods of fixation and management which the practitioner might look for in a work of this character.

As a whole the volume gives an impression of being crowded—an impression increased by the free use of small type for the description of technical procedures and the descriptions of figures in the text. In general, however, the book may be regarded as giving an authoritative exposition of the subject from the present-day German standpoint.

LAWSON TAIT.

LAWSON TAIT died over twenty-three years ago after a very full life. This JOURNAL in an obituary notice published on June 24th, 1899, said: "To see him once was to remember always his short burly figure, his leonine head, his determined mouth, and his masterful expression. Self-reliant, possessed of great abilities, an indomitable will, a dauntless courage, and a consciousness of his own genius, he would have risen to eminence in any profession. . . . No one could meet him without feeling the influence of his strong individuality, the vigour of his thought, and the originality and freshness of his views. He took part in many fierce controversies, both in the medical and in the lay press. He was a born fighter, he revelled in the joy of conflict, and would fling himself with all the ardour of his pugnacious nature into the arena of debate."

Dr. STEWART MCKAY of Sydney has now written a rather large book—*Lawson Tait: His Life and Work*,[3] which has for its subtitle, "A contribution to the history of abdominal surgery." It contains a general account of Tait's life and work, supplemented by personal observations made whilst Dr. McKay was his assistant in 1891.

The book commences (Ch. I and II) with an account of Tait's parentage and education until in 1866 he obtained the diplomas of L.R.C.P. and S.Edin. In 1867 he became house-surgeon at Wakefield Hospital, where he had the unusual opportunity of performing five ovariotomies. In 1870 (Ch. III) he started at Birmingham in general practice, but having taken the diploma of F.R.C.S.Edin. he began to publish contributions on gynaecological subjects, based on what he had learnt from Sir James Simpson, and to advocate the establishment of a special hospital for women in Birmingham. After a public meeting a house (No. 8, The Crescent) was taken. Tait, who in 1871 had passed the examination for the F.R.C.S.Eng., was appointed surgeon; he continued to serve on the staff until 1893. Chapter IV details his first remarkable case of an enlarged ovary, containing a chronic abscess prolapsed into Douglas's pouch. The patient had suffered from the condition for many years; the result of its removal by abdominal section in 1872 was most successful. Through this case and through Battey's communication in the same year, an excessive performance of bilateral oöphorectomy was brought about (Ch. XXVI).

In 1880 (Ch. XVII and XVIII) Tait made a most important contribution to the advance of surgery in his paper on the treatment of pelvic suppuration by abdominal section. His systematic writings on gynaecology began with his essay on the pathology and treatment of ovarian disease, for which he was awarded in 1872 the Hastings gold medal of the British Medical Association. The essay was published in 1873 (Ch. V and VI). Tait's final systematic work was to have been a treatise on *Diseases of Women and Abdominal Surgery*, in two volumes; the first volume was published in 1889, but the second did not appear. Tait began his communications on hysterectomy for uterine fibroids, and hystero-myomectomy, in 1874 (Ch. VII and XXX).

In 1877, following Simpson, Tait wrote on hospital mortality, advocating small hospitals (Ch. IX), and after that took up an attitude of antagonism to bacteriology and Lister's system of antisepsis in its application to ovariotomy (Ch. XV).

Previously the dominant consideration which prevented surgical operations on the abdominal cavity had been the danger to the peritoneum of infection from without, and Spencer Wells was well advised in adopting Lister's method to prevent catastrophes. It chanced, however, that the peritoneum was tolerant of some micro-organisms, whilst the methods which Lister had introduced for compound fracture of the leg and for wiring a fractured patella, so far as the spray and the insertion of solutions of carbolic acid or mercury perchloride were concerned, proved not only unnecessary but actually harmful in the case of the peritoneum. Tait in decrying bacteriology and deductions from it was virtually trusting, though without being aware of the explanation, to the special tolerance of the peritoneum, as well as to the chance that there would not enter the peritoneum any infection which it could not tolerate (Ch. XVI and XXXII). Although he did not originate them, Tait took an important part in popularizing operations on the gall bladder and hydatid cysts of the liver (see Ch. XI and XIV); an important section of the book is contained in Chapter XII, which gives a full description with good illustrations of Tait's operation for the repair of rupture of the perineum. Even more important are Chapters XX and XXVIII, relating to his operations for rupture of ectopic pregnancy, which he began to perform in 1883. John Parry of Philadelphia, in his essay published in 1876, had emphasized the results of the pitiless termination of extrauterine gestation when left to itself. Besides these principal subjects, a number of others, with the advance of which Tait was concerned, receive notice in various parts of the book. Dr. McKay does not profess to be impartial, and he frankly warns his readers in the following paragraph, with which the final chapter of the book concludes:

"I have held a brief for my dead master, and I trust that I have been able to show in the preceding pages that Lawson Tait was one of the great pioneers in surgery, inasmuch as he was the real founder of modern abdominal surgery."

[2] *Atlas und Grundriss der traumatischen Frakturen und Luxationen.* By Professor Dr. H. Helferich. Tenth edition. Munich: J. F. Lehmann. 1922. (Cr. 8vo, pp. vii + 475; 443 figures, 61 plates. 15s.)

[3] *Lawson Tait: His Life and Work.* A Contribution to the History of Abdominal Surgery and Gynaecology. By J. Stewart McKay, M.B., M.Ch., B.Sc. London: Baillière, Tindall, and Cox. 1922. (Roy. 8vo, pp. xii + 578; 34 plates. 25s. net.)

The reader will therefore expect to find Tait's achievements praised without much discrimination, but he will be surprised that Dr. McKay has not kept to the rule—"of the dead nothing unless good." We have said that the book is large; it must, we fear, also be said that it is not well balanced. What is good and worthy to be remembered concerning Tait is set out, but attention is diverted by the introduction of extraneous matter, such as a sketch of the history of gynaecology from the earliest times, about which Tait, when he began to write, knew little and perhaps cared no more. The account of the state of abdominal surgery and gynaecology at that time, whether in this country, on the Continent, or in America, with which Tait might have been expected to have acquainted himself, and which therefore properly finds a place in any biography of him, is rather obscured by long excerpts from papers by him, in which much that is of the highest merit is mingled with the trivialities of bygone controversies. Dr. McKay does not indicate that he has himself made any investigations to ascertain the truth or otherwise of the statements he repeats —some made by Tait himself, some by others. The book contains a chapter entitled "Personal narrative of Tait's method of work," and Dr. McKay also produces descriptions by visitors to Tait's earlier operations; they differ very little from what he himself has written, and may be considered superfluous. Whereas in earlier years Tait appeared to lead as regards surgical technique he fell behind later on. Researches in the science of bacteriology founded by Pasteur were steadily effecting a revolution in surgical procedure, represented in the earlier stages by Lister's antiseptic system, and modified later by the change which followed upon the experiments and writings of Schimmelbusch. The impression therefore made on visitors to Tait's operations depended upon the individual visitor's acquaintance with the influence bacteriology was already exercising on surgery. Hence the opinions expressed by surgeons who were following the guidance of bacteriology were very different from those quoted by Dr. McKay.

When Dr. McKay decided to revive some stories, why did he omit others just as well or ill founded? Surely he would have better fulfilled his object if he had restricted himself to the expansion of such accounts of Tait as those by Sir D'Arcy Power in the *Dictionary of National Biography*, by Mr. Alban Doran, and others. Why did he not limit himself to a full description of what is of permanent importance in Lawson Tait's work concerning ectopic gestation, pelvic and tubal suppuration, the repair of the perineum, and the number of other advances made?

In exhuming various passages in Tait's life Dr. McKay has done his master ill service. Chapter I, page 3, begins: "Robert Lawson Tait was born at 45, Frederick Street, Edinburgh, on May 1st, 1845. He was the son of Archibald Campbell Tait, of Dryden, who was a guild brother of Heriot's Hospital." It is then stated that his father was a lawyer and cousin of the Archbishop of Canterbury, next his mother's name and her birthplace are given, and it is added that Tait was educated at Heriot's Hospital until he entered with a scholarship the arts course at the University in 1860; yet after these specific statements Dr. McKay must needs proceed to revive the gossip that Tait was the son of Sir James Simpson, and rather emphasizes the matter by printing opposite one another (see Pl. IV and V, p. 8) photographs of Tait and Simpson. There follow various assertions, impressions, inferences: that Tait did not deny this paternity when mentioned in his hearing, and that he asserted that he had assisted Simpson on many occasions. Dr. McKay returns to this story several times without adducing any real evidence on the matter. Contemplation of the following dates might well have made him reserve his opinion. Simpson was born in 1811; in 1839 he became professor of midwifery, and in that year he married; he had nine children, and died in 1870. Tait after quitting the arts course for medicine was apprentice, pupil, and assistant to McKenzie Edwards, Lecturer on Surgery in the Extramural School; Tait claimed (cf. Tait on Lumbar Colotomy, *Lancet*, June 25th, 1898) that for about six years he assisted Simpson, beginning in 1862 (cf. Tait on the Operation of Extirpation of the Coccyx, *Lancet*, May 14th, 1870) when aged 17, and at the most only in his first year as a medical student. Indeed, Dr. McKay, in Chapter I, appears to follow Tait in applying the term "assistant" to the ordinary attendance of a medical student at the professorial classes. Again, there are various references to vivisection, whilst Tait's remarks on vaccination are omitted. In 1832 Tait read at Birmingham a paper "Upon the uselessness of vivisection upon animals as a method of research" (BRITISH MEDICAL JOURNAL, 1882, i, 677). In 1893, after Horsley had advocated a resolution in favour of the objects of the British Institute of Preventive Medicine, Tait said that he cordially assented to the resolution (McKay, p. 521, and Paget's *Life of Sir Victor Horsley*, p. 214). On page 522 Dr. McKay adds, "Tait certainly made the admission, but to his dying day he still held tenaciously to his objections to vivisection." Mr. Picton, M.P. for Leicester, on April 5th, 1889, in moving a resolution in the House of Commons which has a direct bearing upon the small-pox question at the present moment, said, "Dr. Lawson Tait was not an antivaccinist; but in a paper read at Birmingham in 1882 he said that zymotic diseases were absolutely preventable by securing fresh air, pure water, and abundant light. Many towns had shown by sanitation how to drive away the disease of small-pox."

W. G. S.

"POST-GRADUATE MEDICINE."

IN his book entitled *Post Graduate Medicine*[4] Dr. AUGUSTUS CAILLÉ presents the fruits of an experience of forty years in practice, during thirty of which he has been engaged in undergraduate and graduate teaching. As the title explains, this book is intended primarily for practitioners and advanced students. The author makes a special point of dealing with the prevention of disease and the preservation of health, rightly observing that preventive and corrective measures must go hand in hand and that a book on therapeutics should also be a guide to prophylaxis. He follows the usual lines of classification of disease under the various systems, adding sections on the non-bacterial parasitic diseases, minor ailments, medical emergencies, drug addictions, and poisons and their antidotes. In order to emphasize their clinical importance, especially as regards prevention, early recognition, and treatment, a special section is devoted to the consideration of tuberculosis, syphilis, and carcinosis. Another section is given up to a survey of bedside and office technique. We lay down the book with a feeling that the author has attempted to do too much in the space of one volume. The book contains a great deal of useful information, but the standard is not uniform, and there is evidence at times of the lack of a proper sense of proportion—for instance, quite an elaborate little dissertation is given on the proper method of passing a catheter on the male, with wood-cut drawings to illustrate the position of the catheter in the urethra. Again, in the chapter on syphilis there is a very full description of the method of giving intravenous injections, but when we turn to the chapter on diseases of the heart the electrocardiograph is not even mentioned. The whole chapter on diseases of the heart is below the standard one would expect to find in a work of this nature, particularly in view of the amount of attention which has been given to cardiology during the last ten years, and the revolutionary changes in doctrine consequent thereon. Dr. Caillé pays much attention to dietetics, and gives many useful diet tables for use in various diseases; but we fail to see the scientific value of a table which purports to give the heat equivalents of an "average helping" of different articles of food. The individual's idea of an "average helping" must vary so much as to make it impossible to estimate food values on such uncertain data. The author favours an almost strictly vegetarian diet in all forms of malignant disease, as he states that the normal sulphur metabolism is upset in these conditions.

It may be said that taking the book as a whole the descriptions of signs and symptoms are somewhat too brief and sketchy, but the advice as to treatment is thoroughly sound, practical, and free from bias. The practitioner will find many useful hints in the field of therapeutics and much practical help in the correct interpretation of the results of chemical and serological tests. Dr. Caillé adopts a very sane and well-balanced attitude in regard to the proper relation of laboratory methods to clinical investigation. There is an excellent index, but it is a pity that a wiser discrimination has not been shown in the choice of the illustrations, which in some instances serve no useful purpose whatever, while the standard of reproduction falls much below that of the printing.

[4] *Post Graduate Medicine: Prevention and Treatment of Disease.* By Augustus Caillé, M.D., F.A.C.P. New York and London: D. Appleton and Co. 1922. (Roy. 8vo, pp. xxxviii + 1023; 172 figures. 40s. net.)

INFANT MORTALITY.

THE first edition of Dr. HUGH T. ASHBY'S *Infant Mortality*, which appeared in 1915, greatly aided the campaign for the saving of infantile lives which was then (notwithstanding all the preoccupation of the war) in progress. The second edition,[5] which has now been published, whilst hardly so necessary for propaganda purposes, will be welcomed for the masterly survey it gives of what has been accomplished and of the manner of its accomplishment. The title scarcely conveys a true idea of the contents of the book: "infant life saving" would be more descriptive, for that is the prime object of Dr. Ashby's work. Indeed, as was pointed out in the review of the first edition (July 17th, 1915, p. 99), it is the second part of the volume which has the greater value, and it deals with the administrative measures which are directly concerned with the prevention of death among the young. The author is entitled to take some credit to himself and his book for the improvement in the infantile mortality rate for the nation, which fell to 80 per 1,000 births (or rather live births) for 1920. This figure, however, as the Registrar-General pointed out, contained a fallacy (the large increase in the birth rate for the year), and should be 85; but even this is a great improvement on the previous lowest—namely, 91 in 1916 and 1917. Dr. Ashby says in his preface: "This figure would have been thought impossible to achieve a few years ago"; and he continues: "Another good point is that the birth rate has increased; these two factors show that we as a nation are becoming more healthy." The reviewer agrees with Dr. Ashby in this conclusion, but it is possible that another opinion may be voiced by the Neo-Malthusians. Dr. Ashby is anxious about the increase in maternal mortality during the past two years, and rightly so, for even if the child live he is sorely handicapped by the death of his mother in labour. Dr. Ashby thinks the solution is improved midwifery, and specifies more ante-natal supervision and treatment as one of the means to be used. He is quite right to draw attention also to the stillbirths rate and the primi-hebdomadal (or first-week) mortality, which are both still too high. There is great need for a concentration upon the mortality in the first month at any rate, if not in the first week of life, and that must be done, as was proved at the meeting of the British Medical Association in Glasgow in July, by increasing attention to ante-natal work.

NOTES ON BOOKS.

A TWELFTH edition of Murrell's *What to do in Cases of Poisoning*[6] has appeared under the able editorship of Dr. PHILIP HAMILL. In this edition, which is in larger print than the last, Dr. Hamill has, by judicious omissions, reduced the number of pages by ten, yet has in no way impaired the value of the book, which has been of classic interest and importance for the past forty-one years. War poisons have been wisely avoided, and the omissions include obsolete pills and potions; and there are well-known commercial and other preparations which now figure under more modern terms. Dr. Hamill has added a few new poisons applicable since 1912, the date of the last edition. We are sorry, however, to miss the page on aqua tofana, as, although unimportant in practice, its historic interest varied the condensed style inseparable from such a work; and Socrates still lacks a reference. It is surprising how much and how valuable is the information contained in so small a compass; in an emergency the presence of such a book must be most helpful. This small work should be in the possession of every medical man, and, indeed, has latterly been included as an essential part in an antidote outfit.[7] We might suggest that a short bibliography would have added to the book's utility.

But for the war, *Aids to Tropical Hygiene*[8] would doubtless long ago have reached its second edition, but, as Colonel BLACKHAM observes in his preface, the allied armies campaigned in many tropical theatres of war, and the medical experience gained has resulted in so great an increase in our store of knowledge that he has had to rewrite the greater part of the volume. There are twelve chapters, dealing with climate, air and ventilation, water and water supplies, food, clothing, sites and soils, the disposal of refuse, disposal of the dead, insects, animal parasites, the prevention of malaria, and disinfectants; an epidemiological table of diseases; several appendices; an index completes the book. Much useful information is contained in it, and a run through it will not be without advantage even to the expert. For the student it should also prove of value in showing him what specially to study and the various points he is expected to know about. There are many useful hints which the layman could also quite well appreciate. For missionaries going abroad and out of reach of doctors it should prove of use. The sanitary part is particularly good, but the whole of the text, with a few exceptions, can be recommended.

Dr. G. W. C. KAYE, head of the Radiology Department of the National Physical Laboratory, has done well to bring out in a convenient form a clear account of *The Practical Applications of X Rays*,[9] largely based on his Cantor lectures before the Royal Society of Arts in 1921. The text, which is comparatively short, has been most successfully and generously illustrated, the number of pages being not very much in excess of that of the figures. The first chapter deals with the nature of x rays and their relation to the electron, Moseley's law, and the generation and the detection of x rays. The x-ray bulb and the high potential generator are fully described in the next two chapters, and then the problem of the measurement of x rays is discussed in twenty pages with many tables and figures. The medical applications of x rays are rapidly summarized, the advance in technique and apparatus being illustrated by two radiographs of the hand, one taken in 1896 with an exposure of twenty minutes, the other taken last year by Dr. R. Knox with an exposure of one-hundredth of a second. There is a radiograph of the finger-prints taken, according to Béclère's method, after the finger-tip had been rubbed with red lead; it shows the design of the finger-print peculiar to the individual and also the shape of the bone. The chapter on the industrial applications is fuller and contains a number of interesting examples, such as the detection of imperfect filling of stars in army signal rockets, examination of the parts of aircraft for flaws, which was introduced by the author and Dr. R. Knox during the war, and the distinction between true old masters and copies. There are two appendices, the first containing the reports of the *X*-ray and Radium Protection Committee, and the second the definitions of x-ray and electromedical terms approved by the British Engineering Standards Association. Dr. Kaye must be congratulated on the production of a well-written and interesting handbook.

Volume XXXIV of the *Transactions of the American Pediatric Society*[10] contains thirty-four contributions on a variety of subjects. Rickets, both on the clinical and experimental side, continues to receive a good deal of attention. Drs. Hess and Unger contribute a valuable study dealing with the relative importance of the clinical signs and the radiographic and chemical data of the disease. Drs. J. H. Hess, Moore, and Calvin examine, by strict laboratory tests, the claims of certain well-known proprietary vitamin products and find them wanting, especially in antiscorbutic properties. Drs. J. Howland and Kramer discuss the calcification of bone with regard to the calcium and phosphorus of the serum in rickets, both from clinical and experimental data. Dr. H. Heiman utters a strong note of warning against indiscriminate tonsillectomy in infancy and childhood. There is a long and careful paper on brain tumours in young children by Dr. Martha Wollsteen and F. H. Bartlett. Seven cases are dealt with: all died, and in all *post-mortem* examinations were made. The careful detailed record of the clinical and pathological data makes this an interesting and valuable study. A number of papers record individual cases of special interest and rarity. Altogether the quality and interest of the contributions to the volume are fully up to the standard of previous years.

Dr. WILHELM STEKEL has published yet another large volume (the sixth) on *Impuls-Handlungen*,[11] dealing, among other subjects, with dipsomania and kleptomania. It contains a general discussion on these and allied subjects, illustrated by many cases related at great length.

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[5] *Infant Mortality.* By Hugh T. Ashby, B.A., M.D., B.C.Camb., M.R.C.P.Lond. Second edition. Cambridge Public Health Series, under the editorship of G. S. Graham-Smith, M.D., and J. E. Purvis, M.A. Cambridge: The University Press. 1922. (Demy 8vo, pp. 224; 9 figures. 15s. net.)

[6] *What to do in Cases of Poisoning.* By William Murrell, M.D., F.R.C.P. Twelfth edition, revised by P. Hamill, M.D., D.Sc., F.R.C.P. London: H. K. Lewis and Co., Ltd. (32mo, pp. 279. 4s. 6d. net.)

[7] An Outfit for Immediate Treatment of Cases of Poisoning. By C. A. Stidston, M.D. BRITISH MEDICAL JOURNAL, February 12th, 1921, p. 232.

[8] *Aids to Tropical Hygiene.* By Colonel R. J. Blackham, C.B., C.M.G., C.I.E., D.S.O., M.D., etc. With a Preface by Lieut.-General Sir J. Goodwin, K.C.B., F.R.C.S., etc. Second edition. London: Baillière, Tindall, and Cox. (Fcap. 8vo, pp. viii + 240. 4s. 6d. net.)

[9] *The Practical Applications of X Rays.* By G. W. C. Kaye, O.B.E., M.A., D.Sc., A.R.C.Sc. London: Chapman and Hall, Ltd. 1922. (Demy 8vo, pp. viii + 135; 96 figures. 10s. 6d. net.)

[10] *Transactions of the American Pediatric Society.* Thirty-fourth Session. Edited by Henry L. K. Shaw, M.D. Volume xxxiv. Albany, New York: J. B. Lyon Company. 1922. (Med. 8vo, pp. xviii + 332.)

[11] *Impuls Handlungen.* By Dr. W. Stekel. Berlin and Vienna: Urban and Schwarzenberg. 1922. (Sup. roy. 8vo, pp. ix + 520; 4 figures.)

CAUSES AND PREVENTION OF BLINDNESS.

FINAL REPORT OF THE COMMITTEE.

(*Concluded from page 987.*)

Industrial Eye Disease and Accident.

Blindness and impairment of vision from industrial causes arise in the main from accidents; they are serious and responsible for much economic loss.

In the Scottish Register of the Blind in 1922 there was a percentage of 7.2 whose blindness was due to accidents occurring in their occupations.

The miners and engineering and metal trades headed the list in equal proportions; the greatest incidence is between the ages of 20 and 30 years. Of some 3,700 hospital in-patients suffering from the effects of eye accidents 2,336 were industrial.

Statistics were furnished by Mr. McBride of the Commercial Union Assurance Company of claims made by accident insurance companies. Of 111,000 claims 2,585, or 2.33 per cent., were eye accidents. This witness suggested that it might be assumed that in general industry 1 workman in 30 meets with an accident a year and that 1 in every 1,287 would meet with an eye accident involving injury.

Statistics are deficient on the point of the amount of loss of vision in various industries; even the figures for mines and factories are unsatisfactory. The Committee therefore recommends the pooling of information in possession of the insurance companies regarding accidents, and that this information should be made available to the Government departments concerned.

Industrial Disease Affecting Eyesight.

The principal industrial diseases that affect eyesight are various forms of poisoning, cataract in glass and iron workers, pitch ulceration, and miners' nystagmus. Apart from miners' nystagmus the number of cases of loss of vision is small. The dangers involved are, however, serious, and the relative immunity is due to the stringent precautions taken.

Lead poisoning is now rare; formerly cases of blindness due to lead were found in institutions, now there are practically none. Amongst house painters thirteen such cases were reported from 1905 to 1910, but only three since the later date. These good results are due to the removal of lead dust by exhaust ventilation, use of leadless or low solubility glazes, introduction of labour-saving devices, and the periodic medical examination of the workers by the certifying surgeon. Rare cases of blindness have been debited to poisoning by trinitrotoluene and carbon bisulphide. No authentic case of poisoning with wood alcohol is known here, but it is said to be frequent in the United States. Glass-workers' cataract is not common, and it would be abolished if the workers wore the spectacles made of the glass specially devised for their use, but attempts to persuade them to do this are very disappointing. Dr. Legge, of the Home Office, said that the use of machinery in bottle making would probably eliminate the risk. Iron-workers' cataract is due to the same effects of intense light and heat, and is only to be prevented by the use of appropriate glasses. There was no evidence of injury arising from electric welding where such glasses are always worn. Pitch ulceration affecting men engaged in dealing with patent fuel is a less rare cause of trouble; goggles or crêpe afford protection, but it is hoped that better methods of handling the stuff will be found. Miners' nystagmus has been so recently dealt with by a special committee that this committee deemed it unnecessary to make any inquiry, but it reproduces and emphasizes the findings of the Miners' Committee that light and more light is the way to prevent the disease.

Eye Accidents in Factories and Workshops.

The evidence shows that in factories and workshops the chief source of injury to the eyes lies in the metal and engineering trades, including shipbuilding. There are some few accidents in other trades, such as aerated water manufacture, the textile trades, and industries using chemicals.

Figures for metal workers show an incidence of eye injury from 2.5 to 5.49 per cent., according to whether light or heavy work was done. The majority of accidents are due to flying fragments of metal; these account for about 68 per cent. of cases; splashes of molten metal are the chief cause of the others. The report deals with the special measures necessary for the prevention of accidents in the several branches of the industry and at some length. Many difficulties are involved, especially where the work done has some risk to life and limb only to be obviated by the freest and most unobstructed eyesight. Accidents from bursting soda-water bottles are now rare, mainly due to the use of better machinery. The wearing of goggles is compulsory, but workmen are loath to wear them. In textile industries the special dangers arise from flying shuttles, but cases are "infinitesimal compared with the number of looms." Nevertheless there is room for improvement, and it is recommended that the Home Office should invite the textile industries to investigate the danger of injury from flying shuttles with a view to securing improvement in the guards.

Chemical accidents are very rare:

> "We are impressed by the very low record of serious impairment of vision which the evidence reveals; such a result reflects great credit on the efforts to secure protection and treatment of those accidents that occur."

The risks of eye injuries in factories and workshops are greatly increased by defective vision in the workers; it is therefore important that corrective glasses should be used. Children under 16 years of age are examined as to fitness before entry to the factories, but over that age, with rarer exceptions, there is no eye examination. The Committee thinks this omission should be remedied. Better lighting and better screens and guards are also needed, and there is a recommendation to this effect.

Goggles and Masks.—Considerable attention is given to the use of protective goggles and masks in various industries. Often these are the best means of protection from injury; the evidence is emphatic on the point. It is, however, notorious that there is a widespread reluctance on the part of workmen to wear goggles. The employers provide them freely, but it is rare to find them on the workmen. Part of the objection arises from the bad fit of frames, and the frosting and steaming of lenses, but "there is an old prejudice, hard to remove, especially amongst chippers and fitters, that the use of goggles implies a certain lack of that skill in so cutting the metal that it will neither injure the operator himself nor a fellow worker, also a suggestion of overcaution which the younger worker rather resents." The Committee makes observations on several points in regard to the fitness of goggles for work, and recommends that the Home Office should take immediate steps to issue detailed specifications of the most suitable forms of goggles and masks for the respective industrial processes. Better goggles would mean less objection to them. The Committee looks for much help from the Joint Industrial Councils, whereby the workmen themselves will become the propaganda agents of their use, and it recommends the encouragement of the Works and Safety Committees. Ultimately it may be desirable in many trades to make the wearing of face protectors compulsory, but the time for that is not ripe.

First Aid in Factories.—The importance of securing prompt treatment of eye accidents is strongly emphasized. A trifling injury may become septic and lead to the loss of the eye. Dr. Lister Llewellyn gave details of 163 accidents; of these 44 resulted in loss of one eye, yet with prompt treatment he thought at least 33 of these might have been saved. In Glasgow Ophthalmic Hospital, of 1,000 in-patient cases of eye accidents 300 were infected corneal abrasions. A leaflet is now issued by the Home Office, which is included in every first-aid dressing-box, giving instructions for the early attention to eye injuries. In mines the position is less easy owing to the injuries occurring underground, where there can be no satisfactory ambulance provision; yet in these places injuries are very common, and lead to a large loss of working time. The aggregate of absences due to 4,340 of such accidents accounted for some 18,000 weeks. It does not appear that any sufficient protection against such accidents can be given except by some forms of face protector, but with the insufficient lighting of mines these are impracticable. With improvements in lighting something might be done. In quarries goggles are now largely worn, and their use should be extended. The provision of surface ambulance equipment to mines is extending; marked interest is shown in this connexion by managers. As an ideal it would no doubt be advisable that after every eye injury, however slight, the worker should at once proceed to the surface for first aid or medical treatment. But this is not practicable. It is advised that at least some form of provision for washing out an injured eye below ground should be provided, and the Committee recommends accordingly.

Accidents in Civil Life.

In agriculture accidents occur in hedging and ditching, in stack making, tending cattle, broadcasting fertilizers. In some of these tasks suitable goggles could be worn, but in the unorganized state of the industry it does not appear that effective measures could be taken in this regard.

In civil life there are many accidents. The risk of these is inevitable under the conditions of modern life. Their prevention, so far as they are preventable, appears to be a matter mainly of individual common sense and caution.

"We may, however, draw attention to the large number of accidents amongst children caused by forks, scissors, knives, hat pins, and similar objects, and also to the frequency of accidents from stone throwing, catapults, tip-cats, etc. In view of these instances and of the large proportion of accidents occurring before the age of 16 years, we think that instruction and warning could usefully be given in infant-welfare centres and schools, and that this should be reinforced by the use of suitable posters."

The war has been responsible for a large addition to the number of the blind. The number of pensioners totally blind in England, Wales, and Scotland is 1,520; besides these there are many cases of seriously impaired vision.

Sympathetic Ophthalmia.

A tragic feature of accidental injuries is the liability to sympathetic ophthalmia. The condition may arise from injuries that at first sight do not appear dangerous. Children appear specially liable to the risk. In a number of returns accounting for 4,000 cases of blindness the incidence is 2.4 per cent. The incidence has markedly diminished in recent years under modern methods of treatment, but the disease is still a serious source of irremediable blindness, and might be further reduced. An example of what can be done is given from war conditions. Mr. Ormond reported only 2 cases amongst 4,000 eye cases, of whom 780 had a damaged eye removed, whereas in the American Civil War there were 16 per cent. of cases and in the Franco-German 17.9 per cent.

"Although obviously not universally applicable, prompt removal of the injured eye eliminates all risk of sympathetic ophthalmia, and it is probably owing to this that the sympathetic ophthalmia after eye injuries showed such an extremely low incidence in the recent war."

The danger of the development of this fell disease should always be present in the mind of the medical practitioner, and all cases of penetrating wounds of the eye should be placed immediately under the observation of an ophthalmic surgeon.

The Committee emphasizes the necessity of promptitude in the diagnosis and treatment of disease and injuries of the eye. In this connexion it is necessary that there should be no deficiency in the provision available, whether in the knowledge and equipment of the general practitioner or in the readiness of access to specialist services. The Committee welcomes the beginning which has been made in the provision by certain approved societies of ophthalmic benefit for insured persons, and hopes that every effort will be made to extend such arrangements on a satisfactory basis.

Treatment by Unqualified Persons.

A separate section is given to the consideration of the treatment of eye disease and errors of refraction by unqualified persons. The findings of the inquiry held by the Privy Council in 1908 are summarized; these show the disastrous results that may follow treatment by persons who assume such titles as "ophthalmologist," "qualified ophthalmic optician," and the addition to their names of such letters as F.I.O. or F.S.M.C.(London), which lead the public to believe that they are fully qualified medical practitioners. At the time of the Privy Council report there was a dearth of skilled medical advice in eye diseases, but the Committee reports: "The number of medical practitioners who are competent to deal with errors of refraction and diseases of the eye is rapidly increasing at the present time. This is largely to be attributed to the fact that medical inspection of school children is now being rapidly developed, and in an increasing number of schools throughout the country errors of refraction are corrected and spectacles are provided. In most areas little difficulty is now found in obtaining medical practitioners sufficiently qualified in ophthalmic work to deal with refraction in school children."

Evidence was given to the Committee on behalf of organized bodies of opticians, "that many people who test sight and prescribe spectacles are untrained and incompetent," and on that account these organized opticians desire that there should be "an official register of trained and qualified opticians."

The Committee states:

"An optician who practises ophthalmoscopy, and who advises and prescribes glasses for clients who consult him directly, poses by implication as an expert in the detection and treatment of eye defects, and claims a degree of medical knowledge which he does not possess. There is only one place where ophthalmology can be learnt, that is at a hospital, and an optician may do positive harm by prescribing glasses for cases in which error of refraction is accompanied by some disease which he is incapable of detecting. . . . Even reputable opticians . . . are liable through lack of medical training to fail to recognize diseased conditions. But unscrupulous persons who deliberately advertise themselves as competent to treat diseases of the eye are a far greater danger to the public. If such a register as is suggested were established, it would probably be difficult to prevent such persons, who might succeed in obtaining admission to the register, from posing and advertising themselves as experts competent to treat diseases of the eye."

Also:

"The public would regard the register as an official guarantee that those whose names were included in it were competent not only to provide but to prescribe glasses, and generally to deal with defects of vision from whatever cause arising. For the above reasons we are of opinion that it would be undesirable in the interests of the public to establish a register of opticians such as has been suggested. The proper function of the optician is not to prescribe glasses, but to provide them to the prescriptions of an ophthalmic practitioner, and an official register of opticians would tend to mislead the public into thinking that registered opticians were competent to discharge functions which belong only to those who have had a medical training. . . . Our views on this question are based upon our opinion that ophthalmology cannot be practised without a knowledge of medicine."

From time to time men or women professing to cure diseases of the eye gain notoriety by the aid of specious advertisements, and thereby attract for treatment large numbers of the public. The methods adopted by these persons are many and various; some proffer special lenses, others advocate the disuse of any kind of lens, whilst others advocate the use of electricity, magnetism, and so forth. Evidence was taken concerning one of these so-called "systems."

The Committee reports:

"As our opinion has been definitely challenged in this matter we feel it our duty to record the conviction that the resort by sufferers from eye troubles to irregular practitioners who practise for gain . . . so-called 'systems' of treatment is not only futile but positively dangerous, particularly in those cases of disease in which prompt use of appropriate medical or surgical remedies is of vital importance, and where delay may entail the risk of irreparable damage to the eyesight. The Committee is also convinced from the experience of those having special knowledge of work in institutions for the blind that the circulation among the blind or nearly blind of such advertisements as were submitted by a witness does positive harm by arousing false hopes, which are doomed to bitter disappointment."

Conclusions.

The Committee concludes:

"It is certain that much blindness is preventable. The perfecting of medical diagnosis and technique will effect much, as will the success attending public health activity directed against unhygienic environment and conditions inimical to health. Certain factors predominant in the production of blindness in former days, as small-pox and trachoma, both dependent upon infection, have now been checked, and we have little doubt that a later generation will similarly view some present causes. Ophthalmia neonatorum and syphilis, predominant to-day, are also dependent upon infection, and although the problem of dealing with them is more complicated success in the campaign against venereal disease is, in our view, the key to the prevention of blindness from these two causes."

"Prevention of blindness from the more strictly medical aspect consists in the efficient treatment of already present disease or injury. Here the first line of defence must be the general practitioner: hence the necessity of an adequate training in ophthalmology which, in our opinion, is not at present assured. Further, in view of the frequent occurrence, in disease and injury of the eye, of cases which require the supervision of an ophthalmic surgeon, there must be facilities to ensure that specialist services are readily available. These conditions being fulfilled, there would then be the less opportunity for the unqualified practitioner, whose specious claims too often delude sufferers until the possibility of amelioration has passed."

The report gives a summary of the seventeen recommendations under the following heads: those referring to the prevention of ophthalmia neonatorum; to the educational provision of blind and partially blind children; for the better education of medical students in ophthalmology; and for the prevention of industrial eye injuries. Each of the recommendations has been given in our summary of the report.

As we have said, the report is commendably brief; it is also simply written and with a minimum of technical terms, so that its purport may be readily comprehended by all.

British Medical Journal.

SATURDAY, NOVEMBER 25TH, 1922.

MEDICAL ORGANIZATION IN SOUTH AFRICA.

In the Supplement this week we reproduce a letter which has been sent from the head office of the British Medical Association in London to all members of the Association resident in South Africa. The letter is signed by the Chairman of the Organization Committee and the Medical Secretary, and we may express the hope that it will be weighed most carefully by every medical man and woman to whom it is addressed. The organization of the South African profession, as many of our readers are aware, presents a difficult problem in medical statesmanship, needing for its solution, not only sound sense and wise forethought, but also goodwill, patience, and tact.

Among other difficulties the matter is complicated by racial issues; there is a considerable section of the profession and of the public in South Africa with whom the word "British" is highly unpopular. This feeling, which it would be affectation to ignore, is a factor that has to be reckoned with by the British Medical Association in its efforts to promote medical unity among our colleagues of that country. The position in South Africa is complicated also by the presence of many medical men, both British and Dutch, who belong to no professional organization, and whose apathy is unlikely to be shaken by anything that may be done by their colleagues at home or in England. Last year a referendum was taken of all the practitioners in the Union of South Africa on the question of the future organization of the profession in that country; not more than half replied. A fresh referendum is now about to be taken. In essence the question is whether, in order to secure unity of the profession in South Africa, it is necessary that the machinery of the British Medical Association in that country shall be broken up and its organization replaced by a new body, independent and autonomous but affiliated to the parent Association. Further information regarding the referendum will be found in the report of the last meeting of the South African Committee of the British Medical Association, which also appears in the Supplement this week.

The principle of federation has been formally accepted by the Representative Body of the whole Association, and it follows that dissolution of the South African Branches and of the South African Committee, as a preliminary to federation, if desired by a sufficient majority of the members of the British Medical Association in that country, would be acquiesced in (though with great regret) by the parent body. This attitude of the parent Association, we hasten to say, has been generously acknowledged in the medical press of South Africa and in many private communications. The conditions to be observed and the several points which should be present in the minds of South African members when deciding this momentous issue are set out in the letter printed in the Supplement. The whole tenor of the letter is governed by the closing paragraph, and this is of such importance, as a safeguard against any possibility of misunderstanding, that we quote it again in full: "It must be clearly understood that in putting these considerations before you the Council wishes, if possible, to retain its South African members as organized members of the one great Association, and it would do much to secure this. But it has no intention of withdrawing from the offer it has made. If the members of the British Medical Association in South Africa come deliberately to the conclusion that it will be better for the profession in South Africa that the British Medical Association should disappear from that country to make room for an organization believed to be more likely to satisfy South African needs and aspirations, the Council will accept that decision loyally and will proceed with the process of federation, so that the new body may be kept in as close relation to the British Medical Association as the new circumstances will permit."

It only remains to assure our colleagues in the Union of South Africa that the one concern of the Council of the British Medical Association is to bring about a solution of this difficult problem which shall best conduce to the advantage of the profession in South Africa and throughout the sister nations.

THE CAUSES AND PREVENTION OF BLINDNESS.

In our issues of last week and of to-day we have given a full summary of the report of a committee on the causes and prevention of blindness. Sympathy with the blind, and the sense of responsibility which the community feels for them, has been given concrete form in the Blind Persons Act of 1920, and this makes the report most opportune. All efforts must be concentrated on the prevention of blindness, for no sympathy, sentimental or practical, can make up for the loss of sight. We look to the committee's report to tell us what are the most frequent causes of blindness, and how these causes may be removed. The answer to the first question, What causes blindness? can only be reached by careful examination of the statistical information which has been gathered during many years past. The committee gathered from many sources the fullest information available, but, as with so many similar inquiries—for example, the Royal Commission on Venereal Diseases—though much labour has been given to their collection, the data rarely proved to be sufficient.

One point, however, is clear: among 25,840 blind persons (out of a total of 34,890 known to be alive in England and Wales on January 1st, 1919) no less than 21 per cent. were blinded within the first year of life. Thereafter the number was increased by almost exactly 10 per cent. for each decade of life up to 70 years. At any one time the greatest number of blind persons will be found in adult years—15 to 50—for in that period is the greatest aggregation of population. The heavy incidence of blindness in infancy brings us at once to ophthalmia neonatorum, which, according to Mr. Bishop Harman's figures, accounted for a full half of the tale of blind infants. The report shows that in recent years medical practitioners have learnt more fully to realize the gravity of the condition; that there has been a steady growth of knowledge of this disease among midwives and sanitary authorities, and that this knowledge has been reflected in practice. There is better observation of pregnant women, scrupulous cleanliness at the birth, the use of Credé's method in cases of suspicion, watchfulness for untoward symptoms in the first few days of life, and better and prompter treatment. It thus comes about that despite an increase in the number of cases notified in recent years, which is probably an effect of the greater activity with which the disease is being combated, there is good evidence that the number of cases of blindness due to this cause is diminishing. The London statistics quoted from Mr. Harman's evidence are significant. In two succeeding periods of seven years the number of children admitted to the schools for the blind was almost equal, but in the first period the percentage of those blind from ophthalmia neonatorum was

18.03, as against 11.91 in the second period. Figures were obtained from other sources, showing that there has been a reduction in blindness from this cause elsewhere. A purulent inflammation of the eyes may occur in the newborn as a result of several bacterial infections, but almost the only dangerous organism is the gonococcus; this points to the need for ante-natal treatment. So also with syphilis, which takes a heavy toll of sight by manifestations of congenital disease in children and of the acquired disease in adults. At present venereal diseases are the most prolific causes of blindness; prevent or cure them, and blindness due to them may become as rare as blindness from small-pox, that old-time destroyer of sight.

The increasing stress of highly organized modern life makes defects of vision of serious importance; hence the need for preventing damage to eyes by inflammation in childhood or by the accidents of industry in later years. Phlyctenular keratitis in children causes much injury; it is a condition dependent mainly upon poor nutrition —possibly an avitaminosis. At any rate, the best cure for it is cod-liver oil and the better conditioning which comes by a change to healthier surroundings, so that its prevention is almost wholly a matter of social organization. We can never hope completely to abolish accidents in civil life; some are so accidental as to be unavoidable —they can neither be foreseen nor prevented. But most industrial accidents may be avoided by the suitable guarding of machinery, the use of goggles, and the improvement of methods of manufacture; and, above all, by the provision of good light for all work and the selection of workpeople who can see well.

The committee does not encourage any hope of a dramatic reduction in the number of blind persons, save only among those arising from venereal disease; as the only measures available it urges that greater attention should be given to the education of medical students in eye diseases, that specialist services for the prompt diagnosis and treatment of eye defects and disease should be extended, and that steps should be taken for the betterment of social and industrial conditions where these are the determining factors. There is no short cut to the attainment of these objects. This is equally true of the regular examination of patients' eyes for lesser defects of vision, and the prescription of correcting glasses. Some would raise up a new class of minor practitioners—prescribing opticians—and register them. The committee urges, and we think rightly, that the importance of sight is such that there is no room for minor practitioners; their existence involves a major danger—blindness from unrecognized disease. To encourage well-trained medical practitioners to undertake eye work there is no better way than by making official appointments for ophthalmic work part-time posts. A part-time officer gives the rest of his time and service to the general public, to the common advantage. The whole-time officer is withdrawn from private practice, and the value of his skill is lost outside his limited scope. Altogether the report of the committee is an eminently practical document which ought to have a very useful effect both on public opinion and on administrative bodies.

CHEESE POISONING.

LAST July three outbreaks of food poisoning, all attributed to cheese of Canadian origin, occurred in widely separated areas in this country— Dover, Warrington, and a village in the Newmarket Rural District. Cheese is not an article popularly associated with outbreaks of food poisoning, although there are a number of references available in the literature.[1] Vaughan reported some 300 cases with no deaths in 1883 and 1884 in Michigan. The chief symptoms described were diarrhoea, vomiting, and abdominal pain, with a certain amount of fever; rigors and collapse were often present. The incubation period, which was usually from two to four hours, might be prolonged to eight or twelve hours. In 1901 Sir George Newman, at that time Medical Officer of Health for Finsbury, reported outbreaks in Finsbury, Bermondsey, and other districts. These were attributed to cheese of Dutch origin, though nothing was found wrong in its taste, odour, or appearance. Both Sir George Newman and the wholesale merchant who sold the cheese ate some of it and were attacked. The incubation period in these outbreaks was from two to eight hours. From an aqueous extract of the cheese associated with the Michigan outbreak Vaughan separated a crystalline body which he called tyrotoxicon; it resembles diazobenzene. This body was isolated also from some of the cheese associated with the London outbreaks. Other similar occurrences include two in the United States in 1886, without any deaths, tyrotoxicon being found. In Aldershot[2] twenty-seven cases with three deaths occurred, and in addition to the usual symptoms jaundice was noticed in many of the cases. Some of the patients, however, were stated not to have eaten the suspected cheese. Tyrotoxicon was found in cheese recovered from the stomachs of sheep which had eaten the remains of the suspected cheese. It is not present in all poisonous cheeses. Savage remarks, perhaps significantly, that "there are few, if any, recent references to the finding of tyrotoxicon in cheese, and all these reports date from the period when the chemical and ptomaine theory of food poisoning was predominant." His view is that this form of food poisoning is usually due to the production of powerful toxins by bacteria, probably virulent strains of bacilli of the coli or Gaertner group.

In the outbreak at Dover in July, 1922, after eating Canadian cheese derived from one wholesale source, some 100 persons in about thirty families (about 90 per cent. of those eating it) were attacked; the symptoms included abdominal pains, in many cases amounting to severe colic, diarrhoea in most cases, and vomiting in many. There was a moderate rise of temperature, and a quickening in the pulse rate. The incubation period was from four to twelve hours. There were no deaths. Suspicion was not attached to any other article.

The recent Warrington outbreak, which occurred at the Union Workhouse, affected some 130 inmates, about half of those who ate some Canadian cheese; none of the staff, except the cook who alone tasted it, was attacked. The main symptoms reported were intense abdominal pain, vomiting, and diarrhoea. There were no deaths. The outbreak in the Newmarket Rural District was a small affair; about a dozen cases in some half-dozen families are known to have been attacked; possibly there were a few more. Acute diarrhoea and vomiting, with violent abdominal cramp and pains, occurred within six or seven hours.

Bacteriological examination of these cheeses by aerobic and anaerobic methods on various media yielded no positive information of value. Chemical investigations for tyrotoxicon and poisonous metals such as arsenic and antimony also gave negative result. Experiments on mice gave toxic but variable results, depending probably on the distribution of the toxin in the cheese. Within varying periods, from twenty-four hours to a few days, the affected mice suffered from loose but not liquid stools, with paralysis or weakness of the hind legs; in some cases the animals are described as being wet, and ceasing to care for their appearance; two mice died with spasmodic movements of the whole

[1] See W. G. Savage's *Food Poisoning and Food Infections*, Cambridge University Press, 1920.

[2] BRITISH MEDICAL JOURNAL, 1899.

body, and others showed tremors. At necropsy minute or, rarely, well-marked petechial haemorrhages were found in the gastric and intestinal mucosae.

The bacteriologist (Mr. Bruce White) of the University of Bristol made feeding experiments upon himself with the raw cheese. With about 5 grains of the Dover and Warrington samples respectively, he produced illness within some seven hours. From the Dover cheese this was mainly nausea and headache, lasting for about a day, and with the Warrington cheese considerable internal discomfort persisting for several days. Alcoholic extracts of the cheese were found not to be toxic, and an extract of cheese made with distilled water for forty-eight hours at 52° C. gave with a 10-grain dose no result; both the Dover and the Warrington cheeses, extracted with distilled water, with grinding and shaking, and then filtration, produced within a few hours, when the equivalent of about 7 grains of cheese was taken, considerable internal discomfort which lasted for about two days. Various other experiments were made without positive result. It was concluded that the poison was in the nature of a protein or a true "toxin," unevenly distributed throughout the cheese. No evidence of the food-poisoning groups of organisms was found in these Canadian cheeses, nor any metallic poison or tyrotoxicon.

THE SMALL-POX OUTBREAK.

The struggle continues of the public health authorities and the guardians to stamp out the severe strain of small-pox which has appeared in Poplar and various places in and near London. In a statement to the Metropolitan Asylums Board on November 18th the Chairman of the Infectious Hospitals Committee reported that since July 25th 67 cases of small-pox had been admitted, of which 22 had proved fatal, 9 had been discharged, and 36 remained under treatment. None of the fatal cases had been vaccinated since infancy. Since the date of this report another death has been recorded, and several new cases have occurred at Poplar, and one at Bermondsey. On November 21st there were 34 cases under treatment—namely, 29 from Poplar and one each from Bexley, Paddington, Bermondsey, Dartford, and Stepney. Meanwhile large numbers of prudent people are taking the precaution to render themselves invulnerable to attack, and the red band round the left coat sleeve was in evidence among M.Ps. at the reopening of Parliament. A later development is the discovery of a case on board the Canadian Pacific steamer *Montclare* before reaching the quarantine station a few miles below Quebec. The vessel had left Liverpool on November 10th. The passenger affected was from Wales, and was aged 24. He was a cabin passenger on his way to settle in Western Canada. As a result of the discovery 221 cabin passengers had to disembark for detention in quarantine, as both the emigrant and his bride had been mingling freely with the other cabin passengers. All were immediately vaccinated, together with the rest of the passengers and crew. The equipment at the quarantine station was so limited that bedding and food had to be provided from the ship, which after thirty-two hours' detention and thorough fumigation proceeded on its voyage. With regard to the difficulty which may be encountered in the diagnosis of small-pox and the dire results which may follow "missed cases" we would direct the attention of readers to the letter from Dr. Wanklyn which is published at page 1045. His experience of small-pox is probably unrivalled at the present day, and all the points he makes are worthy of the most careful attention; for, as he says, very many practitioners, and not only those in the younger years, have never seen a case of small-pox, so completely has the disease been controlled by efficient vaccination. At the same time he praises the acumen of many medical men in making a correct diagnosis in the first case of small-pox they have ever seen.

ADENOMYOMA OR ENDOMETRIOMYOMA OF THE OVARY.

For some years it has been known that islands of tissue, identical in structure with the mucous membrane of the uterus, were occasionally to be observed in the ovary; but that such islands are indeed endometrial, not only anatomically but also functionally, was first demonstrated by J. A. Sampson in a paper read before the American Gynecological Society last year. In this paper, an abstract of which appeared in our columns on February 4th, 1922, Sampson recorded 23 cases of what he called "perforating haemorrhagic cysts of the ovary." He believes that such cysts are not rare, and that when they do occur are frequently bilateral, usually densely adherent, and apt to rupture during operative removal owing to the reopening of a previous perforation which had become sealed by adhesions. Microscopic study led him to the conclusion that the cysts are due to the accumulation of blood in the gland spaces in the endometrial islands. During the present year convincing support for this view has been supplied by British gynaecologists, and the autumn number of the *Journal of Obstetrics and Gynaecology of the British Empire* contains three papers on the subject by Professor Archibald Donald, Professor Blair Bell, and Drs. Fletcher Shaw and Addis. The most interesting point emerging from these three papers is undoubtedly that Professor Donald had, from purely clinical observation, formed and expressed the opinion as long as three years ago that these "tarry" or "chocolate" cysts were related to the condition of adenomyoma. He had, however, failed to obtain clear histological proof of his view although his assistants had been investigating several specimens histologically. The first histological proof in this country was supplied by Professor Blair Bell, and immediately afterwards other cases in which the histological characters could be demonstrated were met with by Dr. Fletcher Shaw. In the cases recorded by Donald and by Fletcher Shaw and Addis there was the further most interesting feature that in thirteen out of seventeen instances the "tarry" cysts of the ovary were associated with adenomyoma in the recto-vaginal space. This is a matter of great interest clinically and may be of great importance pathologically; the frequency of the association—over 75 per cent.—is unquestionably significant. Dysmenorrhoea coming on after the age of 30 or becoming markedly aggravated at or after that age would appear to be one of the most uniform symptoms, and in general the cases are probably such as would be diagnosed as "chronic pelvic infection." Probably many such cysts have been wrongly regarded as "lutein cysts" in the past. There can be no doubt that Sampson's paper in America and the three papers to which we have referred will stimulate research into the subject, and it is to be hoped that further light will be forthcoming as to the origin of adenomyomata in general. Professor Blair Bell makes an emphatic appeal for the employment of the term "endometriomyoma" because the essential element in all these tumours is tissue which is not merely anatomically but also functionally "endometrium." The older term is, however, so closely interwoven with the early literature of the subject that it is doubtful whether the advantage of greater scientific accuracy in nomenclature will bring about its displacement.

THE HOME AMBULANCE SERVICE.

The Home Ambulance Service, organized jointly by the Red Cross Society and the Order of St. John, is steadily being extended and new ambulances are put in commission as local demands arise. The total number at the end of September was 317. During the third quarter of this year six new ambulance stations were opened, and the number of cases carried was 13,403. The increase is, we believe, in part due to the fact that members of the medical profession are becoming better acquainted with the facilities the service offers. Information regarding ambulance stations in his neighbourhood will be supplied to any medical man who cares to apply to the Secretary of the Home Service Ambulance Committee,

19, Berkeley Street, London, W.1. The ambulance can be used for the transport of patients from their homes to a hospital, or vice versa, and their aid is invaluable in accidents. Having this in mind the Committee has supplied a list of ambulance stations to road scouts and patrols of the Royal Automobile Club and the Automobile Association; both these institutions have shown a keen interest in the service and have given much help in its development. Although such a service, covering the whole country, was not thought of until demobilization placed a number of ambulances which had been in use in France at the disposal of the Joint Council, already the public has become so accustomed to the existence of the service that it has learnt to feel it a grievance if an ambulance is not immediately available. One London daily newspaper in a critical article asserted "that it is better that two ambulances should arrive at the scene of an accident than none." With that expression of opinion everyone will agree, but it is an extravagant method which ought to be avoided. Difficulties have sometimes occurred—not we believe in the case of ambulances maintained by the Home Service Ambulance Committee—owing, as is alleged, to uncertainty as to the financial liability that may be incurred by sending for an ambulance. It is clear, of course, that a national ambulance service such as has been established in England, and does not exist to a like extent in any other country, can only be maintained on a voluntary basis if due provision is made for the cost of upkeep, either by public subscription or by charging reasonable fees for the use of the ambulances. Only in this way is it possible to provide for the transport of necessitous cases outside the scope of the Poor Law, who form so large a proportion of those carried by the Home Ambulance Service. It is, however, the universal practice of those in charge of Home Service ambulances to meet calls promptly, and, if necessary, postpone questions of payment until the work is completed. Both methods of maintaining an ambulance station—that by public subscription and that by charging fees—are in use, and in some districts the two are combined. A district Motor Ambulance Association in Brecknock, which is financed by public subscription and makes no charge for the use of the ambulance, was able to show a substantial balance for the year ending May, 1922. As an example of the other method we may take the facts given in the annual report of the Sussex Branch of the Red Cross Society for 1921, where charges are made for each use of an ambulance. There was a small loss on the first quarter, and a small profit on each of the other three quarters, so that the final result for the year was that the receipts were £1,028 and the expenditure £976. We believe that any difficulties at present existing—and they are not numerous—will pass away as the system becomes better known, and members of the medical profession can do very much in this direction. Difficulties will diminish also as the system becomes more complete and co-ordinated. In this connexion we are glad to observe that a number of independent ambulance stations have become affiliated with the Home Ambulance Service established by the Joint Council. It is not possible to make any general statement as to the charges made in those areas in which the ambulance is not maintained wholly by voluntary subscriptions as the method adopted varies. In some instances a flat rate is charged within the area; in others, perhaps the majority, there is a mileage rate varying from 1s. 3d. to 9d. a mile. The local committee determines the manner and rate of payment. It should, perhaps, be added that arrangements will be made to transport patients long distances, either direct, if this be necessary, or by taking patients to the railway station at the one end and fetching them from the other.

THE CONVERSAZIONE AT THE ROYAL COLLEGE OF PHYSICIANS.

THE outside of the Royal College of Physicians, at the corner of Trafalgar Square and Pall Mall, is heavy in design and always grimy, owing, possibly, to the character of the stone of which it is built; but the interior is a very agreeable example of the domestic architecture of a hundred years ago. It was built from the designs of Sir Robert Smirke, R.A., and was completed in 1825. The greater part of the ground floor is occupied by a large reading room and by the hall. The central staircase, which becomes double at the first landing, leads to a large library in which meetings are held. It was here that the President, Sir Humphry Rolleston, and Lady Rolleston received those invited to the conversazione given by the President and Fellows on November 21st. It was the first held since the war and was very largely attended. Opening off the large library is the room used by the Censors; it looks eastward over Trafalgar Square, and is one of the most charming examples of how architects in the early part of the nineteenth century got their effects from proportion rather than ornament. In this room are collected some of the best and most interesting of the portraits possessed by the College. Some of the manuscripts and early printed books possessed by the College were displayed, as also the silver caduceus made for Dr. John Caius in 1566, the large silver-gilt mace presented by Dr. John Lawson in 1683, and a number of other pieces. The gold-headed cane used by Dr. Radcliffe, Dr. Mead, Dr. Askew, Dr. Pitcairn, and Dr. Baillie, Harvey's demonstrating rod, and Jenner's cow's horn, as well as other curiosities, were also shown. In the theatre on the second storey nature films, lent by the Regent Film Company at the instance of Lord Ashfield, were shown.

BODY TEMPERATURE OF BIRDS.

THE essential difference between the two great groups of warm-blooded and cold-blooded animals is that the former have a constant temperature independent of their environment, whereas the latter have a variable temperature which is practically the same as that of the surroundings in which they live. This is due to the presence in warm-blooded animals of a heat-regulating mechanism by means of which the heat production and heat loss are so balanced that the body temperature remains practically constant; cold-blooded animals possess no such heat-regulating mechanism. The body temperature of birds has been made the subject of an exhaustive study by Alexander Wetmore,[1] the main features of which are analysed by Professor Sutherland Simpson in *Nature* (October 28th, 1922). The heat-regulating mechanism and normal temperature of birds has, as Professor Simpson points out, received very little attention from physiologists, so that this monograph forms an important contribution to avian physiology. Altogether more than 1,558 individuals of 327 species of birds were investigated by Wetmore, who used specially constructed thermometers of the clinical type, but with a range between 95° and 115° F. The temperatures of birds were found to present the same diurnal rhythm as occurs in warm-blooded mammals, but in nocturnal birds, such as owls, the normal rhythm was reversed, the temperature being highest during the period of activity at night, and lowest during the day—the period of rest. This diurnal rhythm would be reversed in day birds by keeping them in darkness during the day and exposing them to artificial illumination during the night—an observation which lends support to the view that the normal diurnal rhythm of warm-blooded animals is due merely to the action on the body of various outside influences, and not to a fixed periodicity of which the temperature rhythm is an expression. There appears to be no evidence of seasonal temperature variation in birds in spite of the fact that they show such marked cyclical bodily changes as are manifested by moulting and adornment with fresh plumage. As in the case of mammals the temperature of the female was usually found to be slightly higher than that of the male of the same species, and the temperature control of nestlings and immature birds was less perfect than that of adults. Very little heat is lost by radiation and evaporation from the skin, owing to the feather coating and absence of cutaneous glands, so that heat loss is controlled by the respiratory system, an important part being played by the air spaces. It holds as a general rule, though there are some exceptions,

[1] Smithsonian Miscellaneous Collections, Vol. 72, No. 1[illegible]

that the higher the bird in the zoological scale the higher is the body temperature. The highest average temperature for both sexes was found in the western pewee with a mean of 110.2° F. Pigeons, cuckoos, and woodpeckers stand high in the list, but contrary to general belief swallows, as a group, possess the lowest average body temperature, usually below 107° F.

RAT CONTROL.

In connexion with the fourth annual National Rat Week a conference was held at the offices of the Holborn Borough Council on November 6th, with the Mayor of Holborn in the chair. Mr. E. C. Read (technical adviser on rat repression to the Ministry of Agriculture) said that the geographical position of Britain made it the great centre of rat attraction, because of the goods conveyed in ships to this country and because it had the largest warehouses in the world; thus Britain harboured a large percentage of the rats belonging to other countries. In cities rats had excellent means of communication through the sewers; if the sewers were not kept clear the buildings would never be rid of rats. He suggested that the London County Council, the City Corporation, the metropolitan boroughs, and the home counties should organize one unified scheme for the treatment of sewers in that big area. He believed that as science advanced many diseases would be related to the presence of rats and mice in human habitations. In regard to rat poisons, barium carbonate and squills in various preparations were the most efficacious. Sir Frederick Andrewes emphasized the danger of using bacterial rat virus for the destruction of rats in urban districts. Up to a certain point those preparations were efficacious, but unfortunately all the animals which ate them did not die, and he had found that many of the rats that survived had acquired immunity. Of the rat viruses sold some were made from the Gaertner bacillus and some others from the Aertrycke bacillus. A considerable number of cases of food poisoning, however, had been traced to one or other of the two bacteria he had named, so that it had not been proved that those viruses were harmless to man. Dr. F. J. Allan (M.O.H. City of Westminster) concurred in the view that if rats could be got rid of from the sewers houses would be practically free of them. The difficulty was in keeping them out of the sewers; though poison was put down time after time a great number of rats seemed to survive somehow or other. Rat-lime had been used a good deal in the City of London and other districts, and had been found very effective. Dr. G. Millson (M.O.H. Southwark) said that in his district there were ten to twenty acres of new houses, but not a single old drain had been taken up, and these formed rat runs. He had applied to the London County Council, but was told that they did not intend to do it. For catching rats he had used varnish with great success in hundreds of cases. Dr. W. M. Willoughby (M.O.H. Port of London) said that what was most necessary was to get the rat above ground and then rat-proof the food stores. If the rat lived down a drain it must come up for food and should then be cut off. The two great factors in rat increase were undisturbed nesting and access to food. Mr. A. E. Moore said that poisoning should be reinforced by rat-catching. He suggested that it was the duty of the Ministries of Health and of Agriculture to see that the whole matter of an efficient rat poison should be thoroughly thrashed out. The Mayor of Holborn thanked Dr. Hutt (the Medical Officer of Health) for his services in calling the meeting together and for bringing to general notice the extent of the rat pest.

SMALL-POX IN SHANGHAI.

Small-pox is endemic in China, and we learn from the Report for 1921 by Dr. Arthur Stanley, Commissioner of Public Health for Shanghai, that that city was affected by the disease in epidemic form towards the end of the year. In the whole year it caused 248 deaths, of which 204 were in the Chinese population and 44 in the foreign. In November there were 31 deaths amongst the Chinese, and in December 161, whilst among the foreign residents in the same two months there were 23. The population of Shanghai is estimated at 804,000, of whom 24,000 are foreign, the rest Chinese. The last previous outbreak was in 1918. There is the usual tendency to ignore vaccination when small-pox is absent, but in 1921 there were close on 34,000 vaccinations, or more than had been done during the years 1904 to 1912 inclusive. Since the latter year there have been nearly 200,000 free vaccinations. Dr. Stanley insists that "China is no place for the unvaccinated. It seems necessary to give a warning to those who are responsible for bringing employees out to China that vaccination should always be done before embarkation." The death rate from all causes in Shanghai was 18.2 per 1,000 amongst foreigners and 11 amongst Chinese. Dr. Stanley's report indicates how much good work is being done by his department. In particular mention may be made of a general public health notice for foreigners published during the year. It points out the preventability of many diseases and the availability of the health staff for advice and assistance. It gives instruction as to individual measures, especially as to care in eating and drinking under the conditions of Shanghai. Nothing should be consumed that has not been recently cooked, boiled, or sterilized. Advice is afforded as to various items of dietary, because "the preventable diseases specially prevalent in Shanghai are mostly caused by infected food." Exclusion from houses of flies, rats, and mosquitos is urged, and the risks are pointed out of vegetables and fruit grown near the ground being contaminated by water containing night soil. The whole report is thoroughly practical, and shows how an officer trained in the broad principles of disease prevention can apply them to the circumstances of a foreign country and climate.

THE ROYAL SOCIETY MEDALS.

The Royal Society has awarded one of the Royal medals to Mr. J. Barcroft, F.R.S., of Cambridge, for his researches in physiology, and especially for his work in connexion with respiration, and the Buchanan medal to Sir David Bruce, K.C.B., F.R.S., for his investigations and discoveries in tropical medicine. It has awarded the Copley medal to Sir Ernest Rutherford, F.R.S., for his researches in radio-activity and atomic structure, the Davy medal to Professor J. F. Thorpe, F.R.S., for his work in synthetic chemistry, and the Darwin medal to Professor R. C. Punnett, F.R.S., Professor of Genetics in the University of Cambridge.

LECTURES AT THE ROYAL COLLEGE OF SURGEONS.

The Bradshaw lecture to the Royal College of Surgeons of England will be delivered by Sir William Thorburn, K.B.E., F.R.C.S., on Friday, December 8th, at 5 p.m. The subject is the surgery of the spinal cord. The Thomas Vicary lecture will be delivered by Mr. Walter G. Spencer, M.S., F.R.C.S., on Thursday, December 14th, at 5 p.m. He will speak on Vesalius and his delineation of the framework of the human body. Fellows and Members of the College are invited to attend; students and others who do not belong to the College will be admitted on presentation of their private visiting cards.

A lecture on the warble fly, its history and methods of exterminating it, will be given on Friday, December 8th, at 2.15 p.m., by Professor G. H. Carpenter, of Dublin University, under the auspices of the Governors of the Leathersellers' Company's Technical College, at the Leathersellers' Hall, St. Helen's Place, Bishopsgate, E.C.3. It will be remembered (Supplement, October 28th, 1922, p. 161) that the British Medical Association has appointed representatives to take part in a conference with the object of petitioning the Board of Agriculture to make it compulsory for farmers to take steps to eradicate this pest. Professor Carpenter will outline the work that the Warble Fly Committee has carried out, and his lecture will be illustrated by lantern slides showing the various experiments that were conducted. Medical practitioners who are interested in the subject are invited to be present at the lecture.

MEDICAL MEMBERS OF THE NEW PARLIAMENT.

THE following medical men who sat in the last Parliament have been returned to the House of Commons:

Dr. WALTER E. ELLIOT (U.), Lanark. Majority 2,193 on a total poll of 21,817.

Dr. F. E. FREMANTLE (U.), St. Albans. Majority 3,932 on a total poll of 25,256.

Dr. J. E. MOLSON (U.), Gainsborough. Majority 1,799 on a total poll of 21,115.

Sir WILLIAM WHITLA (U.), Queen's University, Belfast; returned unopposed.

To the above names may be added those of two medical men who have previously sat in the House of Commons:

Dr. W. A. CHAPPLE (L.), Dumfries. Majority 2,241 on a total poll of 24,351. (Dr. Chapple formerly sat for Stirlingshire.)

Mr. C. HARVEY-DIXON (U.), Rutland and Stamford. Majority 3,042 on a total poll of 21,985. (Mr. Harvey-Dixon has, we understand, long retired from practice.)

New Members.

The following members of the medical profession have been elected to Parliament for the first time:

Sir GEORGE A. BERRY (C.), Combined Scottish Universities. Returned unopposed in succession to Sir Watson Cheyne, as joint Member with Sir Henry Craik and Mr. Cowan.

Sir George Berry, LL.D., is honorary surgeon-oculist to the King in Scotland and consulting ophthalmic surgeon to the Edinburgh Royal Infirmary; he has been President of the Royal College of Surgeons of Edinburgh and of the Ophthalmological Society of the United Kingdom.

Sir JOHN COLLIE (Nat. Lib.), Glasgow, Partick. Majority 5,472 on a total poll of 18,036.

Sir John Collie, C.M.G., M.D., was formerly Director of Medical Services at the Ministry of Pensions and president of the Special Medical Board for Neurasthenia. He is medical examiner to the London County Council and chief medical officer of the Metropolitan Water Board.

Dr. L. G. S. MOLLOY, D.S.O. (U.), Blackpool. Majority 166 on a total poll of 36,246.

Dr. Molloy is honorary consulting physician to the Victoria Hospital, Blackpool. During the war he served in France and Flanders as major in the Duke of Lancaster's Own Yeomanry; he was twice mentioned in dispatches and awarded the D.S.O.

Sir SYDNEY RUSSELL-WELLS, University of London. Majority 1,653 on a total poll of 7,440.

Sir S. Russell-Wells, M.D., is physician to the Seamen's Hospital, Greenwich, and the National Hospital for Diseases of the Heart. He was Vice-Chancellor of the University of London from 1919 to 1922.

Dr. A. SALTER (Lab.), Bermondsey West. Majority 2,325 on a total poll of 16,917.

Dr. Alfred Salter is the senior partner in a large practice in South London, and has taken a prominent part in social work and local politics. He is a distinguished student of Guy's Hospital and a gold medallist of London University.

Dr. T. WATTS (U.), Withington. Majority 670 on a total poll of 22,686.

Dr. Thomas Watts is a past chairman of the Ashton-under-Lyne Division of the British Medical Association, and has been president of the Association of Certifying Factory Surgeons. He practised for many years at Hyde, Cheshire, where he was a member of the Town Council.

Dr. J. H. WILLIAMS (Lab.), Llanelly. Majority 7,266 on a total poll of 39,160.

Dr. John Henry Williams, J.P., is in practice at Burry Port, Carmarthenshire. He is a member of the Carmarthenshire County Council and chairman of the Health Committee.

Five medical men who sat in the last Parliament did not seek re-election—namely, Sir Watson Cheyne, Dr. A. C. Farquharson, Dr. Nathan Raw, Dr. P. F. B. Macdonald, and Sir Robert Woods. The last-named was one of the representatives of Dublin University, which under the Home Rule Act no longer returns members to the British Parliament. Two medical men who were in the last Parliament were defeated at the polls—namely, the Right Hon. Christopher Addison, who sat for Shoreditch, and Dr. Murray, who was member for the Western Isles.

Mr. Whitley was re-elected Speaker on November 20th, and on the following day members came up in line at the table in the Commons to take the oath and subscribe the roll, preliminary to the State opening of Parliament by the King on Thursday.

RADIOLOGY AND ELECTROTHERAPY.

JOINT MEETING IN MANCHESTER.

A JOINT meeting of the Röntgen Society and the Electrotherapeutic Section of the Royal Society of Medicine was held on November 17th and 18th in Manchester. At the opening of the proceedings in the Physics Department of the University, Dr. ROBERT KNOX, President of the Electrotherapeutic Section, who was in the chair, said that this was the first visit of the combined societies to the provinces, and expressed the pleasure the London members had in visiting Manchester.

The Structure of Metals as Analysed by X rays.

Professor W. L. BRAGG, F.R.S., who read a paper on this subject, said that the *x*-ray analysis of metallic structures opened up an entirely new field of research. Just as chemical analysis told the nature and properties of the constituent elements which went to build up a complex substance, so this new type of "physical analysis" told what crystalline solids were present in a substance and how the atoms in these solids were arranged relatively to each other. Much of the pioneer work in this region had already been done, for the structures of most of the pure metals had been ascertained, but the modifications of metallic properties due to the admixture of other elements were of vast interest to the metallurgist and engineer. An indication of what might be done in this direction was afforded by Westgren's work on the irons and steels. The metallic structures could be elucidated, the effect of dissolved impurities studied, admixture of other phases recognized, coefficients of temperature expansion accurately measured, and the size of crystalline grains determined when these were of colloidal dimensions. It was of the greatest importance that the possibilities of this new method of analysis should be recognized, and research workers trained in its technique. Mr. W. J. WILTSHIRE, of the Research Department, Woolwich Arsenal, said that during the last year or so *x*-ray examination had been applied commercially in various directions, but there were many other possible applications, even at the present stage of development. He discussed various practical points in the use of *x* rays for non-medical purposes. The effect of "scattering," particularly in the photographic plate itself, was dealt with, and also points in the rendering of fine detail in a metal radiograph, and the gauging of correct exposures from absorption curves. The conditions for visual work with the fluorescent screen and the possibility of detecting small flaws with the screen were discussed. Slides were shown of a portable factory *x*-ray apparatus, and also a method of rapid radiographic examination of large quantities of a particular article at the rate of 2,000 a day, designed in the research department at Woolwich Arsenal. Other *x*-ray applications were the accurate measurement (to 1/1000 inch) of hidden components, and also the rapid estimation of the lead content of brass or other alloys.

The Hot Wire Sphygmograph and the Psycho-galvanic Reflex.

Professor A. V. HILL demonstrated the "hot wire sphygmograph" and the "psycho-galvanic reflex." The former, he said, recorded on a string galvanometer the change of electrical resistance of a fine platinum wire suddenly cooled by a puff of air. The record was valuable in studying the time relations of mechanical events occurring in the body, and particularly in measuring the velocity of the pulse wave and therewith the elasticity of the arteries in man. The latter was a vivid physical expression of involuntary bodily reactions to emotion or changes of "attention"; it consisted merely in an alteration of electrical resistance (or rather of polarization) set up through the agency of the involuntary nervous system.

Storage Batteries.

Mr. E. C. MCKINNON, A.M.I.E.E., said that during the last thirty-five years a great amount of attention had been devoted by engineers, scientists, chemists, and inventors to the production of storage batteries for use in science and commerce. They had played a most important part in the great war; the submarine, for example, would be innocuous without storage batteries. Millions of such batteries were made annually for innumerable purposes; the world consumption of lead in their construction amounted to many thousand tons a year, and the number of persons engaged in the industry was estimated at from 100,000 to 150,000. Any real advance in the art must

be looked for from scientifically trained men engaged in technical research, and completely conversant with commercial conditions. Performance in laboratories bore litt'e relation to performance under service conditions. Competition had tended to crush out any refinements which increased cost of manufacture and upkeep, and to reduce the products to a common standard. Standardization also had wiped out many anomalies. The standard battery was a compromise of the factors—capacity, weight, bulk, and durability. Scientific management was necessary to obtain the best results from a battery; a fool-proof battery appeared to be impracticable. Mr. McKinnon detailed some of the technical essentials in storage battery manufacture, and concluded by demonstrating numerous types of batteries and their component parts.

Measurement of High Voltages.

Mr. J. R. CLARKE, M.Sc., said that the methods of measuring high voltages which only gave mean values were not much use to the radiologist, who was chiefly concerned with the peak value of the wave he used. Hitherto the peak value had usually been measured by the spark-gap, though other methods involving condensers, rectifiers, and similar apparatus had been employed. The latter required careful attention in order to obtain good results, and the spark-gap could not be continuously in parallel with the tube. The utilization of the corona in air from a wire surrounded by a coaxial cylinder was suggested. Corona commenced when there was a definite potential difference between the wire and cylinder, depending only on their radii and the density of the air. Such an arrangement could be connected in parallel with the *x*-ray tube, and the corona current between wire and cylinder could be detected either by a galvanometer or telephone. The voltage applied to the tube could thus be measured by observing the conditions under which corona occurred. If the radii were suitably chosen there was extremely little tendency for sparks to pass between the wire and cylinders. By regulating the radii and the density of the air so that corona just should not occur no power was consumed in the voltmeter and it could be operated continuously in parallel with the tube. The corona current might be amplified if desired, to act as a control by means of which the voltage in the high tension circuit could be maintained at a constant value.

Cauterization of Pleural Adhesions under Thoracoscopic Control.

At the Royal Infirmary, in the afternoon, Dr. H. C. JACOBAEUS, Professor of Medicine in the University of Stockholm, gave an address before a large audience on the cauterization of pleural adhesions under thoracoscopic and *x*-ray control. He said that for ten years he had been using the endoscope in studying the peritoneal and pleural cavities. At first he had been concerned only with the diagnostic advantages of the method, and used it chiefly in cases with ascites. After replacing the ascitic fluid with air he was able to obtain a clear and comprehensive picture of the abdominal organs. Later on he combined this laparoscopy with the simultaneous *x*-ray examination of the abdominal organs after introduction of air. The most interesting application of the method was for the examination of the pleural cavity; it was so simple and direct that it could be performed without inconvenience in any case of pleurisy with effusion in which thoracocentesis could be done. After sufficient practice it was possible to distinguish with some certainty between tumour metastases and tuberculous changes. In doubtful cases it was possible to determine the nature of the pleurisy by making an excision under guidance of the thoracoscope. In cases of pulmonary tuberculosis subjected to the pneumothorax treatment a clear picture could be obtained with the thoracoscope of string-like or membranous-like adhesions which might exist, and, by attaching the lung to the thoracic wall, prevent it from collapsing and thus cause the pneumothorax treatment to be a failure. He had devised a method of severing such adhesions with the galvano-cautery. Local anaesthesia was used in almost all cases, and the thoracoscope was introduced through the back. The selection of the point at which to introduce the galvano-cautery to sever the adhesions was of great importance. As in most cases adhesions were high up and to the side, he as a rule introduced the galvano-cautery in the antero-axillary line in the seventh, eighth, or ninth intercostal space. If necessary the cautery could be introduced still higher up, in the axillary line; if the adhesions were near the diaphragm the cautery might be introduced in the lower part of the thoracic wall. The application of the platinum needle of the galvano-cautery was made under the guidance of the thoracoscope. To obviate the risk of haemorrhage the needle was kept at a slight glow.

Among the complications which might occur after the operation was emphysema of the skin, originating from the puncture, but it caused trouble only for a day or two. More important were the pleuritic exudates which might develop after the operation, as shown by the following table:

Without exudate	36
With slight exudate	19
Long lasting exudate and fever	11
Long lasting exudate and fever, accompanied by empyema	7*
Exudate appearing only one to three months after operation	2
	75

* Of the 7 cases of empyema 4 died, 1 soon after operation.

Of the first 78 cases reported, in 55, or about 75 per cent., the method was technically successful in removing adhesions which had prevented the complete collapse of the lung. The clinical results were not so favourable, as only 49 cases, or about 63 per cent., had been freed from symptoms. The following table shows the results in 103 cases from various sources:

Results of Cauterization.

Jacobaeus.	No. of Cases.	Cauterization Complete, or Sufficient for Collapse of Lung.	Good Clinical Result.	Incomplete Cauterization.
Apical adhesions	10	9	8	1
Lateral adhesions	62	45	41	17
Diaphragmatic adhesions...	3	3	1	—
Total	75	57	50	18
Holmboe...	12	7	7	5
Gravesen (Saugmann) ..	16	9	7	7
Total	103	73	61	30

Dr. Jacobaeus then passed on to consider certain cases of tumour operated upon by Dr. Key after examination by the *x* rays and the thoracoscope. His general conclusions were that an *x*-ray examination, both before and after the induction of pneumothorax, was of great importance in the diagnosis and localization of pleural and pulmonary tumours, and that thoracoscopic examination gave valuable information in the diagnosis and localization of such tumours, and verified the *x* ray examination. Where it was not possible to use a pressure-difference apparatus it might be advantageous to induce pneumothorax previous to operation in the pleural cavity. If a pressure apparatus were employed then pneumothorax for the thoracoscopic examination ought to be induced as shortly before the operation as possible, in order that the inflation of the lung after the operation might not be rendered impossible. If the lung was inflated after the operation more favourable conditions for healing were eventually obtained.

Sir HUMPHRY ROLLESTON, K.C.B., M.D., President of the Röntgen Society, who was in the chair, in proposing a vote of thanks, said that the work Professor Jacobaeus had done on this subject broke new ground which required a good deal of thought. Professor G. R. MURRAY spoke of the treatment of pulmonary tuberculosis by artificial pneumothorax, and of the work of Professor Jacobaeus as being definite advance. Professor A. H. BURGESS discussed the technique of the operation, and favourably compared the method of Professor Jacobaeus by cauterization under thoracopic control with division of pleural adhesions by the knife under *x*-ray control.

Dr. MARSDEN said that, though he was not an enthusiastic supporter of the method of treating pulmonary tuberculosis by artificial pneumothorax, he thought some of the failures might be due to the presence of adhesions preventing full collapse of the lung.

Mr. THURSTAN HOLLAND, speaking as a radiologist, praised the series of beautiful radiographs shown by Professor Jacobaeus, and advanced as a reason for the failure of artificial pneumothorax the fact that it was too often done in this country without proper radiographic control.

MANCHESTER ROYAL INFIRMARY.

Opening of the New X-Ray Department.

On the afternoon of Saturday, November 18th, the new *x*-ray department of the Manchester Royal Infirmary was opened by Sir Humphry Rolleston. The proceedings were presided over by Sir WILLIAM COBBETT, chairman of the Board of Management. In his opening remarks the chairman referred to the gift by Mr. Robert McDougall of £5,000 for the equipment of the new department in memory of his father, Mr. Arthur McDougall, B.Sc.; also to an anonymous gift of £4,000 for the intensive *x*-ray treatment equipment and the provision of a research scholarship in this method of treating cancer. Dr. A. E. BARCLAY, senior honorary radiologist, explained the organization of the department, with lantern slide illustrations. Mr. MCDOUGALL responded to the expression of thanks conveyed by the chairman, and Sir WILLIAM MILLIGAN, M.D., chairman of the Research Committee, replied on behalf of the anonymous donor.

Sir Humphry Rolleston's Address.

In the course of his address Sir HUMPHRY ROLLESTON expressed admiration for the splendid *x*-ray department now possessed by the Royal Infirmary, and his pleasure at having that opportunity of seeing what Manchester was doing to-day in one of the most progressive branches of the science and art of medicine. The finished product prompted him to glance briefly at the history of the development of radiology in connexion with that institution since the early days of the application of Röntgen's discovery to medicine. At first the practical utility of *x* rays appeared so problematic that even so finely conceived an institution as the new Manchester Royal Infirmary was planned without provision for a department, and it was not till 1908 that a small room in the basement was formally assigned to the work. The Royal Infirmary was to be congratulated on the patient enthusiasm of Dr. Barclay, who had done so much for its reputation by working up the organization of this department; his great services were recognized by his appointment in 1918 as a member of the honorary staff.

Sir Humphry Rolleston continued:

It is most important that there should be the closest co-operation and communication between the workers in the wards on the one hand and those in the laboratories and radiological department on the other hand. Without such team work and the resulting sympathetic insight into the mutual aims, difficulties, and limitations of these two classes of workers the progress of medicine must suffer and be delayed. Wisely recognizing this essential condition for success those responsible for the construction of this *x*-ray department have provided a large demonstration room with a big *x*-ray and screening apparatus, so that patients can be brought down and examined by the radiologist and the physician or surgeon and the attendant students. In addition a lantern is provided for the demonstration of slides from similar cases to that under discussion, so that light may be thrown on any unusual features in these cases. There will thus be available a collection of negatives and slides—comparable to a museum of pathological specimens—which will become more numerous and so more progressively valuable for teaching and research in medicine and surgery. Team work between radiology and the other branches of medicine may be confidently expected to bear much fruit in research and the advancement of medical science, diagnosis, and treatment. In the case of the Manchester Royal Infirmary the omens in this respect are specially propitious, for not only has Dr. A. E. Barclay an international reputation for original investigation, especially as regards the gastro-intestinal tract, but a generous benefactor who prefers to remain anonymous has provided £4,000 for research in connexion with the intensive *x*-ray treatment initiated at Erlangen, and a strong committee has been set up consisting of Sir William Milligan, Professor Bragg, Professor H. R. Dean, Dr. C. Powell White, Dr. A. E. Barclay, Dr. A. Burrows (of the Manchester Radium Institute), and James Watt, junr.; in May, 1921, Dr. C. C. Anderson was appointed Research Scholar and worked in Germany from July, 1921, to January, 1922. The combination of radiology and anatomy has greatly advanced our knowledge and efficiency in both these subjects; radiology has thrown a flood of new light on normal anatomy, especially of the abdomen; in this field of advance Dr. J. S. B. Stopford, professor of anatomy here, is the pioneer; and it is most appropriate that Dr. J. M. W. Morison was in 1921 appointed lecturer in applied anatomy (radiology) in the University of Manchester. It is obvious that a knowledge of the normal *x* ray appearances and of their physiological variations is fundamental in the estimation of morbid changes and in the detection of disease, and on this subject there still remains much to be done. Team work with pathologists offers an attractive field for investigation; the *x*-ray examination of bodies before *post-mortem* examination, originally practised by Dr. F. H. Williams, of Boston, Mass., in 1906, and found to be of great value in the diagnosis of the thoracic complications of virulent influenza in 1918-19 (H. E. Robertson), is a perennial source of information. Possibly, by combined investigations with pathological workers, the severe reactions of a toxaemic nature that may follow intensive radiations, and are a serious factor in the utilization of the method, may be found, as Aub and Witherbee's experimental work on rabbits suggests, to be preventable by increasing the resistance of the normal cells of the body by some procedure such as the injection of horse serum.

Sir Humphry Rolleston then spoke of the vigorous growth of the art and science of radiology, and the vast increase that this had led to in the demands made on the radiological department. The whole subject, he said, was rapidly expanding and advancing, so that in the near future it would be necessary elsewhere, as had already been done in Manchester, to provide a university hospital with several radiologists, each specializing in a branch of the subject.

The vote of thanks to Sir Humphry Rolleston was proposed by Dr. RAMSBOTTOM, Chairman of the Medical Board. The new department was visited during the afternoon by the members of the two societies. The main features of the department are briefly:

1. Its complete equipment for all kinds of *x*-ray work, both diagnostic and therapeutic.
2. The extensive and well-ventilated premises.
3. The efficient protection of the workers by the use of barium plaster on the walls.
4. A well-fitted workshop in which minor repairs can be done and experimental apparatus made.
5. A demonstration room fully equipped for the exhibition of cases and the teaching of radiology to students.

DINNER.

A dinner was held at the Midland Hotel at 7.30 p.m. About eighty members and friends were present, including the presidents of the two societies. The guest of the evening was Professor Jacobaeus, whose health was eloquently proposed by Dr. R. KNOX. Later on several speakers referred to the value of co-operation between physicists, manufacturers, and radiologists. Sir ARCHIBALD REID outlined a scheme for a British Institute of Radiology which it is proposed to establish in London. The proceedings terminated with various votes of thanks to those who were responsible for the successful arrangements in connexion with the conference.

VISITS.

On Saturday morning opportunities were afforded for visits to various works, including the Chloride Electrical Works, which make storage batteries. Visits were also paid by the medical members of the meeting to the Radium Institute and to the *x*-ray department of the Skin Hospital.

Scotland.

THE SAMSON GEMMELL BEQUESTS.

THE late Dr. Samson Gemmell, admired and beloved by many generations of Glasgow students, and for five or six years before his death in 1913 Regius Professor of Medicine in the University, left a considerable fortune, which passed to his only brother, Mr. William Gemmell. He died recently, and by his will bequeathed his estate, which it is believed will amount to about £100,000, for the benefit of Glasgow institutions. He left £20,000 to trustees for the purpose of establishing a chair in the faculty of medicine or science, to be called the Samson Gemmell chair. The trustees are to confer with the University authorities as to the subject of the chair and the arrangements for the appointment. The trustees are to hold the remainder of the estate as a permanent Gemmell Bequest Fund; its income is to be applied to charities in Glasgow, and mention is made also of charities in the parish of Sorn, Ayrshire, from which place the Gemmell family came.

CENTRAL MIDWIVES BOARD FOR SCOTLAND.

The examination of the Central Midwives Board held simultaneously in Edinburgh, Glasgow, Dundee, and Aberdeen, concluded on November 8th with the following results: Out of 116 candidates who appeared for the examination 99 passed. Of the successful candidates 21 were trained at the Royal Maternity Hospital, Edinburgh, 37 at the Royal Maternity

Hospital, Glasgow, 3 at the Maternity Hospital, Aberdeen, 11 at the Maternity Hospital, Dundee, 7 at the Queen Victoria Jubilee Institute, Edinburgh, 11 at the Cottage Nurses' Training Home, Govan, Glasgow, and the remainder at various recognized institutions.

GLASGOW MEDICAL LUNCH CLUB.

At the meeting of this club held on November 16th the vice-president, Dr. John Henderson, occupied the chair, the guest of honour being Sir William Martin. After lunch Sir William Martin gave a very interesting and illuminating account of the inception and development of the Royal National Lifeboat Institution, and its increasing value to the country. He emphasized that all along it has been supported by voluntary subscription, without any aid or subsidy from the State. The lecturer illustrated his remarks with many important figures, financial and otherwise, indicative of the valuable work done by the institution for the nation. The address was thoroughly enjoyed, and the pleasure and thanks of the members were suitably expressed by Dr. McKail. He referred to the untiring efforts of Sir William Martin in the advancement of the lifeboat cause locally and generally, as, for many years past, organized public collections had been made on an appointed day, and that to these was due the inception of "flag" days, which had proved so valuable in swelling the funds of so many deserving objects all over the country.

Ireland.

PRESENTATION TO DR. M. F. COX.

ON the occasion of his election to be president of the Royal College of Physicians of Ireland, Dr. Michael F. Cox, senior Physician to St. Vincent's Hospital, was presented on Saturday, November 11th, with a beautiful replica of the Ardagh Cup by his colleagues in the hospital. The presentation was made at a complimentary luncheon to Dr. Cox in the Shelbourne Hotel. Surgeon McArdle, who presided, in making the presentation, said that it was a small recognition of life-long work and of the affection and respect with which his colleagues in the profession, as well as in the hospital, regarded him. The honour of being elected President of the College of Physicians was long overdue. As far as his memory went back Dr. Cox had carried himself first of all as a brilliant Irishman, and secondly as a staunch Irishman. There were brilliant Irishmen, he might remark, who were of no use to their country, but the man who combined staunchness and brilliance rightly won their highest appreciation. Throughout his life Dr. Cox had been continuously straightforward with everyone who met him and always true to the poor. He had known him for thirty years and could say that no other man he knew had been so invariably considerate. His loyalty to his hospital was a model for physicians. Surgeon McArdle then proposed the toast of Dr. Cox, a friend of the poor, a patriotic Irishman, and an honour to his profession. After the toast had been duly honoured, Mr. John Dillon, ex-M.P., and a Licentiate of the Royal College of Surgeons in Ireland, thanked the organizers for the opportunity to pay a brief tribute to his old friend, Dr. Cox. Since they had been students together they had remained on terms of the closest intimacy. He did not think there was another physician in Dublin who had been so uniformly and meticulously kind to the poor, or a more steadfast and generous friend. He had steered a straight and honest course through life, and his reward was that there was not a man in the medical profession to-day who was more beloved by the people of Dublin. Dr. Cox, in reply, thanked his friends for their very great kindness; they made him feel very proud and happy, for he realized the generosity which prompted their action. St. Vincent's Hospital and the good sisters were beloved by them all, and he thought he could say that a better staff was possessed by no hospital. He thanked them from the bottom of his heart collectively and individually. The Right Hon. Thomas O'Shaughnessy, Recorder of Dublin, proposed the toast of the Chairman, which was duly honoured.

MR. ANDREW FULLERTON.

Mr. Andrew Fullerton, C.B., C.M.G., F.R.C.S.I., surgeon to the Royal Victoria Hospital, Belfast, read a paper on unilateral diuresis at the Congress of the American College of Surgeons in Boston, which began on October 23rd and terminated on October 28th. He also gave an address before the Toronto Academy of Medicine, and spoke at the Mayo Clinic, Rochester. Since his return to Belfast he has received many congratulations on his election to the honorary Fellowship of the American College of Surgeons. He is the first surgeon in the North of Ireland to receive this distinction.

SMALL POX MENACE.

In view of the outbreak of small-pox in England, precautions are being taken to prevent the introduction of the disease through the port of Dublin. Incoming vessels are thoroughly inspected, and the slightest case of illness on board is reported to the Port Medical Officer. Where any doubt exists, no member of the crew is allowed ashore until the medical officer is satisfied that all risk is removed. Owing to the possibility of infection from second-hand clothing, the acting Port Medical Officer (Dr. M. J. Russell) has instructed the Port Sanitary Inspector to prevent the importation of such articles, and the various shipping companies have expressed their readiness to give immediate information of the arrival of such goods, with a view to disinfection. Dr. Russell reports that during October no case of infectious disease was reported from, or detected in, any vessel which had entered the port; twenty-five foreign vessels were inspected, and fourteen notices were served requiring the keeping of rat guards on the mooring ropes, as a precaution against disease being carried ashore. During the week the Dublin Board of Guardians passed the following resolution by a majority of one:

> That owing to the danger of an outbreak of small-pox in Dublin, the following resolution, passed by the Board on August 4th, 1920: "That it be optional for parents to have children vaccinated," be, and is hereby, rescinded, and that the Board give instructions to have the Vaccination Regulations carried out.

Correspondence.

SMALL-POX DIAGNOSIS.

SIR,—Will you permit me to submit to your readers some observations on this topic which are of urgent professional, and public, importance?

An actual occurrence may give point to my remarks. The first of the 10,000 cases certified as small-pox which I saw in 1901–03 was that of a girl child of a litigious mother, who brought an action for damages against her physician, a competent and careful practitioner, in that he had certified her child to be suffering from small-pox when, in fact, she was suffering from chicken-pox, and by his negligence had ruined the mother's business. The case hung over his head for more than a year, and but for being most ably defended by the Medical Defence Union would probably have caused him severe loss. Before my evidence was called the case was stopped by the jury, who by then were satisfied in effect (*a*) that the physician had taken every care to render himself competent in the branch of medicine in which he was practising and was so competent, (*b*) that on this particular occasion he had taken all due and reasonable care. He had done his best, and no man could be asked for more. The verdict was for the defendant.

That was in 1901. What of 1922? We all know that "missed" cases continue to occur, but in my experience they are much fewer than they used to be; and it makes me exceedingly proud of our profession to find, as I have found on three occasions lately, that colleagues who previously had never seen a case of small-pox had recognized the disease on the first day of the rash. That is an achievement of high merit and shows what can be done by junior men, even though the majority of physicians have never seen a case of small-pox—for the simple reason that there have been none to see.

All the same, cases are still missed, being taken for measles, or chicken-pox, or a drug rash, or scarlet fever, or influenza; and such occurrences lead to a sequel of five, ten, fifteen, or more deaths as the case may be.

Those of us, however, who have seen much small-pox know exceedingly well that many cases present remarkable difficulty in recognition; the majority of the recent London cases have been far from straightforward; this phenomenon has not been due to their vaccinal condition, which, contrary to the experience of Dr. Killick Millard, I have found rather facilitates than obscures the diagnosis, but more often to

a commonly overlooked factor—namely, the specific skin texture and constitution of the individual patient; and anyone who vividly recalls his own early efforts successfully to tackle this most formidable enemy—for myself that was in the early nineties—can have nothing but profound sympathy for the stress and anxiety often thrown on members of our profession. It was this consideration which greatly influenced me in producing my various works on small-pox diagnosis, and now prompts me to mention the matter. Beginning in 1902, I have constantly done all I could to coach my colleagues therein, or at least to place this knowledge easily within their reach. It has been, one might almost say, a labour of love, has occupied my leisure during year after year, and I suppose has cost me not less than £500 of my private means. I find no mention whatever of these rudiments of small-pox diagnosis in leading textbooks of medicine, though the pregnant work of the late Dr. T. F. Ricketts has been before the profession for over twenty years and has been proved by many physicians to be of priceless value; yet many of my medical friends have no idea where to light upon this to them recondite work. Complaint I have none; I only deplore the deficiency in my own powers of persuasion, which I am now attempting to remedy. May I venture to digress here in order to request for future work the loan of any striking small-pox photographs in the possession of your readers, especially if they should have photographs of any of the Poplar or other recent severe cases.

What I am more especially concerned with now is that I am not immortal, and it has always seemed to me one of the real tragedies of existence that a stone of experience which some Sisyphus has rolled up a particular hill should roll down again unchecked at his death; in brief I wish to do all I possibly can to make this invaluable knowledge more widely available. I have done nearly all I can do in this matter, and by way of removing any suspicion of personal advantage—there never was any—I have for some years now been in the habit of placing any surplus over cost of the production of my work towards a special fund for the general furtherance of this knowledge. If you or any of your readers can suggest a more suitable basis I will gladly consider it.

What I do most earnestly seek at this juncture, when the external pressure of small-pox infection seems higher than for twenty years, when the susceptibility of our population, largely owing to non-vaccination, seems also higher than for a long time past, when a single "missed" case may involve us all in a huge disaster, and when in consequence the utmost possible medical vigilance on the part of us all is necessary to tide us over a critical period of great anxiety until the time when the common sense of our people asserts itself (as I rejoice to say it is slowly asserting itself) and voluntary vaccination becomes the rule and finally saves the situation—at such a time I do beg to be allowed to tender to my colleagues whatever assistance of this nature may be convenient to them and in my own power.

In my daily experience I note that the laity themselves are much more educated and alert upon this question than twenty years ago, and in several obscure cases lately the correct diagnosis has been first suggested by the patient. Many laymen are at least cognizant of the marked advance which medical research has made in small-pox diagnosis in this twenty years. It is indeed as striking an advance as any in surgery or medicine. That young practitioners who have never seen a single case should be able to make a correct diagnosis of small-pox on the first day of the rash is indeed a portent; and I surmise that if again one of us finds himself arraigned in the courts by an inturiated patient for having ruined his business by a misdiagnosis, the question will probably be asked by the court what steps the defendant has taken to familiarize himself with recent diagnostic methods, and the verdict will be influenced thereby.

Lectures have been given at several of the London general hospitals, and at one of them the question is understood to be under consideration whether it is desirable to require that applicants for house appointments should have attended a short course of instruction upon the subject. It is to be hoped that this admirable example will come to maturity and be widely followed.

May I, Sir, in thanking you and your readers for your kind attention, submit that the very key of our success in holding this invader in check is instant recognition, and is the very key, too, of success in that ultimate objective upon which we are obstinately determined—namely, the summary expulsion of this pest from among us and the complete security of our island from its loathsome interference for all time to come.—I am, etc.,

London, S.E.1, Nov. 17th. W. McC. WANKLYN.

P.S.—I append a list of publications which may be obtained from the *Medical Officer*, 36, Whitefriars Street, E.C., and from George Wareham, 1, Budge Row, Cannon Street, E.C.: "How to Diagnose Small-pox" (5s.). "Small-pox Notes for Medical Practitioners, with Hints on Small-pox Diagnosis" (6d.). "A Survey of the Present Position of Small-pox and Vaccination as Affecting this Country" (1s.).

THE OUTBREAK OF SMALL-POX AT POPLAR WORKHOUSE.

SIR,—I gather from Dr. Killick Millard's letter (November 18th, p. 1001) that in 1911 some 70 cases of small-pox (with 10 deaths) arose at Mile End, following upon the occurrence of an "overlooked" case of a girl of 12, who had been vaccinated. Dr. Millard says that the press emphasized the neglect of vaccination as a cause of the outbreak, but did not mention that the first case, a girl of 12, had been vaccinated. Dr. Millard is "fairly confident" that a vaccinated case, presenting a modified attack of small-pox, was the cause of the present outbreak.

I deduce from Dr. Millard's letter that it would be better to stop vaccinating, so that when the first case occurs, this being unvaccinated, it could be readily diagnosed, and then would be the time to vaccinate contacts. If this be Dr. Millard's view, I say that it is dangerous, fallacious, and, if adopted, would lead to widespread epidemics of small-pox.

Dr. Millard's unmodified first case, in actual practice, would not be likely to oblige by walking right into the arms of a medical man. More than likely the sufferer would have visited forty or fifty public houses, churches, or cinemas, and, it may be, would have danced at a night club or have attended a meeting of the society for the propagation of contraceptives amongst the heathen (home mission scheme). In this manner the heather would soon be set on fire.

As the crow flies, we in Deptford are not more than three miles from Poplar, and quite naturally there has been an element of expectancy—nay, indeed, strain. With so many unvaccinated people going about, and with a vaccination campaign (and a successful one) on hand in Deptford, Dr. Millard's theorizing is irritating, and might be injurious. At our Council meeting a week ago, when chicken-pox was made notifiable *pro tem.*, an alderman expressed views unfavourable to vaccination, and referred to "eminent medical men" who were against it.

The BRITISH MEDICAL JOURNAL is freely quoted by the press, and who knows but what this "beavered hare" that has been let loose upon an unsuspecting public from the Leicester Public Health Department may be quoted with disconcerting results? Let us have vaccination in infancy, revaccination at 12 to 14, and a third session at 21, with additional interviews with the scarifier as and when necessary. With such sound and convincing practice we would not need to let our hearts be troubled with the "shimmy shake" ideas we are asked to believe.—I am, etc.,

CHARLES S. THOMSON,
Medical Officer of Health.

Town Hall, Deptford, S.E.14, Nov. 18th.

SIR,—Dr. C. Killick Millard may or may not be correct in his supposition that "the patient whose overlooked attack is responsible for the outbreak" of small-pox at Poplar was a vaccinated person. Assuming, however, that his "confident surmise" is correct, it would be interesting to know what he proposes to do about it. The logical sequel of his letter would appear to be the suggestion that vaccination should be made a criminal offence. In this he might be supported by Mr. Arnold Lupton and Dr. Walter Hadwen, although in justice to these gentlemen I must say I am not aware that they have ever openly advocated such a course. I fear it would be but small consolation to the friends of a person who had died of virulent small-pox that there was no difficulty in the diagnosis of his disease. There would still be mild cases of small-pox, just as there are mild cases of scarlet fever and measles which are sometimes difficult of diagnosis. Even now severe cases are sometimes overlooked. I was recently in the company of an eminent surgeon, who, when a house-surgeon forty years ago, had been for eight weeks or so shut up in a

ward of a general hospital along with a small-pox patient who had been admitted under the diagnosis of "pustular eczema." I grant that there would probably be *relatively* fewer mistakes in diagnosis, because every medical man, and perhaps most others, would be only too familiar with small-pox, whereas now hundreds of medical men have never seen a case. It is possible, however, to pay too dearly for the education of medical men and the public in the diagnosis of small-pox.—I am, etc.,

Reading, Nov. 20th. F. W. Stansfield, M.D., D.P.H.

CANCER OF THE SCROTUM.

Sir,—The article by Messrs. A. H. Southam and S. R. Wilson in the Journal of November 18th (p. 971) is of great interest. They attribute to the lubricating oils used in the cotton mills of South Lancashire the property of inducing cancer of the scrotum in mule-spinners, and they announce their intention of investigating the question experimentally.

Though it has long been known that the crude mother liquids from which lubricating oils are prepared predispose to, if they do not actually produce, cancers in the workmen engaged in the refineries, yet no one hitherto has recorded cases of cancer traceable to the action of lubricating oils themselves. At the Glasgow meeting of the British Medical Association in July last, in communicating the results of experiments with the cruder mineral oil products, I reported the fact that I had produced malignant disease in mice with such substances. That paper will, I hope, soon appear in the Journal when the various papers read at the Pathological Section are printed; but may I be allowed to say, meanwhile, that I succeeded in inducing epithelioma experimentally with a lubricating oil which must be similar to, if it is not identical with, that implicated by Messrs. Southam and Wilson? It is interesting, therefore, to have such an unexpected verification from the clinical side of what I had previously shown experimentally. We are gradually working through a series of the mineral oil products used in this country.

The authors, commenting on the apparent rarity of chimney-sweeps' cancer in South Lancashire, make the same statement that other writers on the subject have made since the time of Percival Pott (1775)—namely, that the disease is becoming rarer. All the figures at our disposal show that chimney-sweeps' cancer is as common or as rare now as it ever was: there are on the average five or six cases a year in the whole of England, and in the ordinary course of things there must be instances of large general hospitals which do not have a single case for several years. The disease is, and always has been, very rare in Scotland, and it is rare in Continental countries. This is possibly due to the different coals used.—I am, etc.,

Archibald Leitch.

Cancer Hospital Research Institute, London, S.W., Nov. 17th.

"THE RADICAL PREVENTION OF VENEREAL DISEASES."

Sir,—I have read the correspondence that has been going on under this heading with much interest. It is obvious that if Dr. Caiger's high ideals could be reached all would be well, not only in this, but in other directions too. After 2,000 years, however, of Christian teaching there is still, as someone has said, "too much human nature in humanity." We have to face facts as they are, not as they should be. I think it is a weakness in our profession, when we discuss this subject, that we confound medicine and morals. We are doctors first, and moralists afterwards. We are too apt, in our advice to the public, to let our medical knowledge be warped by expediency and sentiment. By all means let us join those who preach continence and other high ideals; but let us first teach the means for preventing venereal disease.

The time is coming when the State must take strong action in dealing with this question. I feel strongly that Dr. Armstrong is right in his letter of November 11th in advising the notification of venereal diseases. It is the present secrecy of the consulting room and of the chemist's back parlour that encourages much of the immorality that goes on.

I am moving at the next meeting of the Health Committee of this city that the authorities be approached with a view to the inclusion of syphilis and gonorrhoea in the list of notifiable diseases. I hope other members of the profession who are on public bodies in their various centres will do the same.—I am, etc.,

Bath, Nov. 19th. Preston King.

PREVENTION OF ANTHRAX.

Sir,—With reference to Professor Hobday's valuable paper in your issue of November 18th (p. 955)—in which he remarks, "It is time that very much sterner preventive measures were taken against it" (anthrax)—may I point out that the present unsatisfactory condition of the law is, I consider, responsible for some of the cases?

It is at present impossible for anyone contracting anthrax from a shaving brush to bring an action for damages *directly* against the responsible manufacturer or importer of the brush. If this absurd defect in the law were altered, so that the manufacture and import of anthrax-infected brushes became financially dangerous to those responsible for them, the number of cases of anthrax from infected shaving brushes would, I feel sure, quickly diminish.—I am, etc.,

Exeter, Nov. 18th. W. Gordon.

PSYCHO-ANALYSIS.

Sir,—"A. Dreamer" in your last issue concludes his letter by saying that as he desires "to avoid an overwhelming correspondence" he adopts a pseudonym. Therein he shows his wisdom, as it is much easier to enter a correspondence column than to leave the same.

The silence in your issue of November 11th led me to think that all was over, but it was a vain hope, as Dr. McBride returned to the fray on November 18th. I am bound to reply, as I have to enter the protest that I have been misrepresented. The offending passage is: "He [Dr. Steen] apparently believes that thought can occur without physiological nerve and brain activity." I can assure your readers that I believe nothing of the sort, and furthermore I did not say so. I do not accuse Dr. McBride of wilfully misquoting me, and I fancy I understand how he made the mistake. I shall try to make my explanation as short as possible.

There are two conceptions of disorders of mind—the physiological and the psychological. In the physiological conception the assumption is that mental activity is accompanied by corresponding changes in the nervous system. The worker in this branch of study will therefore devote his attention to any alteration in the nervous system which he may observe, and he will try to discover laws which will summarize the knowledge he has gained. These laws will be expressed in physiological terms only.

The psychological conception concerns itself only with mental processes. The student here will collect mental facts, and when he has a sufficient number at his disposal will try to formulate laws, which will be stated in psychological terms only.

"It is of the utmost importance that, in the final 'laws' obtained by either the physiological or psychological conceptions, there should be no mixing of the terms. The physiological laws must contain no psychological terms, and the psychological laws must contain no physiological terms. Nothing but hopeless confusion can result from the mixture of 'brain cells' and 'ideas.'"

Dr. Hart, from whom I am quoting, has discussed the matter with great clarity and brevity. Misconceptions are bound to arise if arguments on big subjects have to be compressed into the limits of letters. This was my main point when I wrote my first letter.

Wild horses will not drag me into a discussion of the relationship between mind and matter.

I have to thank Dr. McBride for the names of the books he recommends, one of which is well known to me. I can also assure him that I did not realize that I was being sarcastic.—I am, etc.,

City of London Mental Hospital, Dartford, Kent, Nov. 20th. R. H. Steen.

THE TEACHING OF PSYCHOLOGY.

Sir,—In the Section of Neurology and Psychological Medicine at the Annual Meeting of the Association in Glasgow, the proceedings of which were published in your columns on September 23rd, 1922, a resolution was unanimously passed asking for the inclusion of the teaching of psychology and psychopathology in the medical curriculum. The urgency of the matter may be shown by the following practical considerations.

1. Dr. Steen, in a letter in your issue of November 18th, gives some samples of cases of acute mental distress which he meets with at his out-patient department. Every experienced medical practitioner could point not only to cases such as these, which would naturally be referred to someone devoting special attention to mind ailments, but he could show that in almost every illness it is the psychical element which is responsible for the major part of human suffering. People are afraid that they are going blind, that the noises in the head indicate serious brain disease, that they are afflicted by some incurable malady, or that they are indeed "going mad." Often these fears, which may be devoid of any foundation, are kept secret lest they be laughed at; thus a vast amount of preventable suffering continues.

2. Everyone who is engaged in any sense in the practice of psychotherapy, whether or not he is technically a psychotherapist, knows that the greater number of these cases in their early stages are easily curable. On the other hand, they also know that it is only by certain methods that these troubles can be relieved. Psycho-analysis is undoubtedly one of these, and we owe to Freud an unspeakable debt for the light he has thrown on the problems of the "unconscious," but I am not a psycho-analyst and therefore I will not attempt to discuss this thorny subject. My own interest in the matter lies mainly in the system of collective treatment by conscious auto suggestion which has been designed by M. Emil Coué. By this method groups of cases can be advantageously treated, and Dr. Monier-Williams and I, who are testing this particular system, are most sanguine as to its wide utility. You have kindly referred to the small free clinic which has been established for this purpose in Chelsea, but it would be of much wider usefulness if some of the larger hospitals would allow this form of treatment to be tested in connexion with their out-patient departments.

3. Unless this matter is seriously dealt with by the leaders of the profession, the inevitable result will be another great extension of the evils of unqualified practice. The public are rapidly learning that mind treatment is necessary for the relief of suffering, and we cannot blame them for seeking help in other ways if the medical profession is not alive to their needs.

I hope that all psychotherapists will combine to press this matter upon the attention of those in authority.—I am, etc.,

London, Nov. 17th. CHARLES F. HARFORD.

INDIRECT RESULTS OF PROSTATECTOMY.

SIR,—It is commonly supposed that the improvement which follows prostatectomy is due to renal relief by the removal of a mechanical obstruction. May I suggest that something has happened which is often of greater importance? The surgeon's attention is often drawn to cases in which there has been little urethral obstruction and no residual urine or back pressure, but in which amazing improvement has followed an operation only rendered necessary by slight haematuria. In such patients the prostate is often larger than many which produce obstruction. There may be no signs of renal mischief and yet the patient has been for years in lamentable health characterized by anorexia, progressive loss of weight, grave depression, irritability, incapacity for prolonged work, and very frequently that lamentable form of sexual irritability which leads to irreparable social disaster. Not unnaturally he gets classed among the neurasthenics and is thereby barred from any real prospect of relief. Such patients are the despair of physicians, who find nothing to account adequately for the condition. It seems to me that there is an explanation of these undoubted facts which has never been offered. It amounts to the definition of a new endocrine disease, which should be called "hyperprostatism." If externally the prostate secretion is powerful, and its effects, however administered, are now beginning to be recognized, it must also act as an internal secretion. But the normal gland weighs, say, half an ounce, while it may increase to ten ounces or even more when adenomatous. The morbid symptoms may be put down to the glandular secretion being itself morbid. This, however, is an unnecessary hypothesis, since oversecretion of a kind the organism is not prepared for is morbid by itself. Such oversecretion probably causes a heavy drain on the body's powers of immunization, and when these break down toxic symptoms result. It must surely be held that any glandular secretion without evolutionary work to do should be regarded as a facultative toxin. Work I am doing elsewhere strongly supports the view that any "out-of-work" secretion is a poison. In this case, therefore, I prefer simple hyperprostatism to dysprostatism, there being no real evidence that adenomatous tissues secrete abnormally. The patient is in the position of possessing a huge abnormal accessory gland for which there are no evolutionary safeguards, and thereby occupies a position strictly analogous to that of a sufferer from hyperthyroidism.

I am allowed to say that these conclusions have met with the general approval of Dr. Langdon Brown, and also with that of Dr. G. W. Nicholson, whose work on tumours is becoming generally recognized; he considers that as a pathological entity this disease has its natural place in morbid endocrinology, while Mr. Sydney MacDonald, whose practical experience in these cases is very great, finds in such a view an explanation of observed phenomena which seemed previously inexplicable. It follows that complexes of symptoms such as those enumerated should, in the case of males in whom tuberculosis and malignancy have been negatived, lead physicians to make the tentative diagnosis of hyperprostatism and to send them to the urologist for examination. Such views will also lead the surgeon to remove non-obstructive adenomatous prostates wherever there is a characteristic but hitherto unexplained cachexia rather than merely to watch them, and to take the same course where dangerous sexual irritability is found. For it must be noted that the removal of a large non-obstructive prostate is followed in most cases by a rapid return of healthy appetite, a great increase in weight, the removal of depression, irritability, morbid sexual erethism, and incapacity for work, while the patient both looks and feels many years younger. I think it may be added that such rejuvenescence is not likely to follow so rapidly upon mere relief to renal disturbance, and therefore submit that from start to finish the drama shows every mark of progressive morbid endocrinism until a revolution is brought about by radical surgery.—I am, etc.,

London, Nov. 15th. MORLEY ROBERTS.

BILE SALTS AND CALCIUM.

SIR,—The letter of Dr. S. Pern in the BRITISH MEDICAL JOURNAL of September 16th (p. 532) on the etiology of goitre gives one much cause to think. It is, however, in its bearing on tuberculosis that it has especial interest for me. All will agree that calcium deficiency plays a great part, perhaps the chief part, in tuberculosis, and I think I am right in saying that hyperthyroidism is very much more common than the opposite condition. What, however, specially concerns me is his statement that bile salts aid in the absorption of calcium. I have for some time been in the habit of using bile salts and duodenal extract in the treatment of tuberculosis, as they stimulate the flow of bile and in this way probably aid in the elimination of toxins.

If bile salts directly aid in the absorption of calcium why should surgeons so fear jaundice in gall-bladder operations? Moynihan, in his work on *Abdominal Operations* (p. 620), dealing with gall bladder operations upon those suffering from chronic jaundice, referring to the diminished coagulability of the blood and the consequent danger of haemorrhage, says: "I have never been convinced that this drug [calcium chloride] had any effect in this direction"—namely, increasing the coagulability of the blood in cases of jaundice. If bile salts favoured the absorption of calcium, surely there would be a tendency to increase coagulability of the blood when calcium was administered in a case of obstructive jaundice. But apparently it is not so.

Langdon Brown, in his *Physiological Principles of Treatment*, says (p. 8):

> "Among the less known effects of iodothyrin on metabolism is its influence on the liver. . . . After ligature of the bile duct the colloid in the follicles and lymphatics of the thyroid gland increases." Again (p. 380): "It is claimed that calcium deficiency may result either from defect or excess of thyroid secretion, but the usual result of thyroid excess is to increase the excretion of calcium, preventing it from being fixed in the tissues or reaching a high level in the blood."

It seems, then, to me that bile salts increase the flow of bile and thus lessen the excess of bile in the liver. The liver being relieved the thyroid has less work to do, becomes more normal, and ceases to excrete calcium.

I raise this point in no controversial spirit, but in the hope that someone with a wider knowledge of endocrinology than mine may give a better explanation.—I am, etc.,

London, W., Nov. 14th. F. E. GUNTER.

CHOLERA OR DYSENTERY.

SIR,—I observe in your review of the War Office statistics in the BRITISH MEDICAL JOURNAL of October 21st a note of the "appalling" death rate of cholera in Mesopotamia—that is, over 40 per cent. Having been there in the hot weather of 1916 as a consulting surgeon I had a chance of seeing the cholera cases. During more than thirty years in the Indian Medical Service I have seen a good deal of tropical disease. I was one day asked by one of the ablest of the R.A.M.C. temporary officers to see his cholera cases. I asked him what was his death rate; he said about 45 per cent. I told him that that was good as I would expect it to be 90 under the conditions prevailing. When I saw the cases I said they were not cholera but bacillary dysentery, and advised the officer to stop milk diet, to feed the patients on dilute rice water, and to give them sufficient magnesium sulphate to get several motions daily until all mucus disappeared and the temperature was normal. I told him under no circumstances to give them opium or other drug to stop the diarrhoea as such would be fatal in a few hours.

I saw him a fortnight later and asked how his cases were doing. The reply was that he had had only one death out of many cases since he adopted the rice water and magnesium sulphate, and in the case of that one the patient complained in the night of gripes and the nurse gave him a dose of chlorodyne on her own account and he died a few hours later.

If the war statistics (medical) are no better than those of cholera in Mesopotamia it would be a good thing for posterity if they were scrapped.—I am, etc.,

HENRY SMITH, C.I.E.,
Lieut.-Col. I.M.S.(ret.).

Sidcup, Kent, Oct. 30th.

X RAYS IN HYPERTRICHOSIS OF THE FACE.

SIR,—Dr. William Mitchell's able and courageous critique of my letter to you on this subject is worthy of a better cause, for if the evidence of nearly all the living dermatologists in this country, in America, and on the Continent is to be considered at all, that cause is lost. He need but refer to the articles on the radiotherapy of hirsuties in the most modern editions of their textbooks by Sequeira, MacLeod, Whitfield, and MacKee of Columbia University, to see how overwhelming is expert opinion against the practice he advocates. The last author has minutely discussed the subject in all its bearings, including the medico-legal, and I venture to think—all ethical and other considerations apart—that as in America, so in this country, an indemnity, verbal or written, would hardly avail to protect the operator, in case of a prosecution, for ensuing disfigurement.

Dr. Mitchell has selected in support of his argument for further trial of the method the fact that "twelve years ago many leading engineers and physicists said heavier than air flying machines were impossible." He could scarcely have chosen a more trite illustration, from both his angle and mine, for in both aviation and radiotherapy there still occur disasters of a most distressing kind. This indisputable fact surely goes to confirm my view that the instrument he employs is at present too dangerous a weapon in what is after all a minor disability, for which other therapeutic measures exist.

In one respect I have to cry "touché" to Dr. Mitchell's criticism. I certainly said "too little" in the important matter of the technique used eleven and a half years ago in Sister B.'s case. I can add only one fact to the description already given—no screen was used. I gladly concede this grave error in application of the rays, but I would again emphasize the fact that no stigma appeared for three years thereafter.

I do not desire to base any argument whatever on the results in this case, which is merely cited as an incidental and contemporaneous illustration of the harm that may ensue. I am concerned here with principles only, and those enunciated by Dr. Mitchell I feel bound to condemn. Dr. Mitchell further states, in substance, that "in a number of cases of tinea tonsurans, etc.," in which permanent alopecia was accidentally caused by radiotherapy, there were no bad results as regards the skin.

To this assertion I find it particularly hard to give credence. Every single case of permanent *x*-ray alopecia that has passed through my hands at three general London hospitals has shown coincident or subsequent atrophy, as evidenced by wrinkling and loss of elasticity of the scalp, while not a few developed pigmentation and telangiectases as well.

It has been proved by many histological biopsies in animals that with every epilation dose (or less) to the skin a set of definite vascular and cellular disturbances occur in the epidermis, and that if these irradiations exceed a variable minimum, permanent and irretrievable damage is certain to ensue. Now the germ cell layer of the Malpighian body, and that invaginated portion of it which produces the hair shaft, are anatomically continuous, and pass insensibly the one into the other.

Is it probable that an *x* ray application which causes even a temporary inhibition of hair growth and epilation can under any circumstances leave uninfluenced the equally prolific (and therefore radio-sensitive) germ cell layer of the glabrous skin, which is actually less protected by overlying tissues and nearer the anticathode than the base of a hair follicle? *A priori*, the answer should be no, and in practice the reply is given by the appearance, sooner or later, of the various stigmata already instanced.

There is a small yet important discrepancy in Dr. Mitchell's position to which attention should be called. In the fourth paragraph of his letter he writes: "In each case I warned the patients of the *risks*," and in his concluding sentence are the words: " . . . good and *safe* results may be obtained." Such inconsistency is a bad friend to his own convictions, and scarcely needs further comment from me.—I am, etc.,

HENRY C. SEMON, M.D.

London, W., Nov. 12th.

PERIODICITY OF GNAT BITES.

SIR,—As no one has yet replied to Dr. Beddard's query as to the periodicity of gnat bites (November 11th, p. 951) I venture to offer my suggestion that the recurrent irritation may be due to the acid and alkaline wave which passes over the blood during fasting and digestion. It is well known that in certain skin troubles the irritation increases when the stomach is empty and lessens or altogether ceases after a meal. This relief has been thought to be due to the increased alkalinity or lessened acidity of the blood caused by the withdrawal of acid during gastric secretion. During this last summer I have had several very severe gnat bites, and have always noticed that the irritation was greatest immediately after getting out of bed in the mornings and not ceasing until I had broken my fast. The irritation would return as soon as the stomach was empty, to be relieved by the next meal. I judge that the severer irritation in the mornings was due to the prolonged fast during the night. Hence in my experience the irritant periodicity of gnat bites is much less than twenty-four or forty-eight hours, as stated by Dr. Beddard, and does not differ from irritant periods in other skin troubles.—I am, etc.,

WILLIAM BRAMWELL.

Liverpool, Nov. 19th.

Obituary.

G. N. BIGGS, M.B., B.S.,

Surgeon to the Ear, Nose and Throat Department, Seamen's Hospital, Greenwich, and to the Hospital for Paralysis and Epilepsy, Maida Vale.

GEORGE NIXON BIGGS, M.B., B.S., Lieut.-Colonel R.A.M.C.(T.) and R.A.F., died at the age of 41 years on November 10th, 1922, after an illness lasting from August 23rd, and due to appendicitis and its complications. With his premature death the medical world of London loses a man of exceptional ability, of winning personality, and of great kindliness.

The only son of Dr. M. G. Biggs of Northcote Road, S.W., for many years a member of the Council of the British Medical Association and Chairman of the Central Ethical Committee, G. N. Biggs was educated at Westminster School and St. Thomas's Hospital and in the University of Durham. On returning to London he passed through the appointments of house-surgeon to the Royal Ear Hospital and of Registrar to the Metropolitan Ear, Nose and Throat Hospital, to the honorary staffs of several London hospitals; thus he became surgeon to the Ear, Nose, and Throat departments of the Evelina Hospital for Children, the Dreadnought Hospital for Seamen, the Royal Waterloo Hospital for Children and Women, and aural surgeon to the Hospital for Nervous Diseases, Maida Vale. On his retirement from the Evelina Hospital he was honoured with appointment as consulting surgeon, although at the time a young man. As teacher in practical rhinology, laryngology, and otology in the post-graduate school at the Seamen's Hospital, Greenwich, he

carried on one of the most attractive and popular courses there; many old post-graduate students throughout the world will have very pleasant memories of his skill as an operator, his unfailing courtesy and unwearying patience in the demonstration of the work of his department.

Although the activities of his laborious hospital appointments and very busy private practice would have overwhelmed many men, Biggs's power of work was such that he was able to devote enthusiastic attention to many other sides of life. No friend ever called upon him for help without immediately securing ungrudging devotion of time and energy. In his private capacity his unselfishness, kindliness, and gentle courtesy never seemed to fail. He found time to write a valuable book on *Diseases of the Ear, Nose and Throat*, articles in the *Dictionary of Practical Medicine*, and many papers in the *Archives of Otology*, the *British Medical Journal*, and the *Proceedings* of the Royal Society of Medicine.

From an early period of his life he took great interest in the R.A.M.C., and, after a service in the Volunteers that began in his student days, he joined the Territorials at their inauguration and was soon promoted to the rank of major. For some years before the war he was one of the few that regarded Lord Roberts's warnings and, foreseeing war with Germany, worked enthusiastically to improve his Territorial unit and to perfect the details of the scheme for its mobilization; for years his only holiday was taken in camp during the annual training periods. He was called up on August 3rd, 1914, as Major and Registrar for the No. 4 Territorial General Hospital and served in that capacity until Easter, 1917. He was then promoted to the rank of lieutenant-colonel and sent to France in command of the Territorial Hospital No. 54; later he was Consulting Aural Surgeon to the Boulogne district. He was mentioned in dispatches, and by the Portuguese Government was made a Commander of the Order of Luis. He was afterwards given the Territorial Decoration, and on return from France in 1918 was attached to the Medical Staff, Royal Air Force.

A man of keen enthusiasms and of lovable character, George Nixon Biggs will be greatly missed.

ROBERT MILNE, M.D.,

Medical Officer of Dr. Barnardo's Homes and Hospitals.

Dr. Robert Milne, whose death on November 8th we regret to announce, was born on a Deeside farm in Aberdeenshire in 1849. He was educated at the Aberdeen Grammar School, and received his medical education at Marischal College, Aberdeen, where he graduated M.B., C.M. in 1874, and M.D. in 1886. For some months he was assistant to Dr. Burns Thomson of Edinburgh, with the idea of going out as a medical missionary to China, but while in Edinburgh he began to have symptoms which were diagnosed as tuberculosis of the hip-joint. He returned to Midmar, Aberdeenshire, where he was confined to bed for a year, and in 1876, while still walking with crutches, he started practising in Midmar. In February, 1880, he accepted an urgent invitation from the late Dr. T. J. Barnardo to come to London to assist in dealing with an outbreak of scarlet fever at the Girls' Village Home, Barkingside, and in the following May he became medical officer to Dr. Barnardo's Homes. Since that time—for nearly forty years—he remained their chief medical officer; he retired at the end of 1919. During those forty years the Barnardo Homes greatly increased, and now have over 7,000 children under their care. Dr. Milne was beloved by the children and most highly esteemed by every worker with whom he came in contact. His was a many-sided post, especially in the early days, and many a child owes his life and limb to his surgical skill, while to many another death lost its terrors through his Christian and kindly ministry.

Dr. Milne's name will perhaps be best remembered by the medical profession in connexion with his advocacy of the use of inunctions of eucalyptus oil (or carbolic oil 10 per cent.) in the treatment of scarlet fever. He considered that systematic, thorough inunctions, in conjunction with the application of 10 per cent. carbolic oil to the throat during the first few days of the fever, modified the severity of the attack and rendered isolation unnecessary. He published articles on the subject in this Journal (October 31st, 1908, p. 1333) and elsewhere. Much success in the treatment of scarlet fever—and also of measles—is stated to have been achieved both in this country and abroad on the lines laid down by Dr. Milne, and his own results were undoubtedly excellent. The general opinion to-day is, however, that in the present state of our knowledge Dr. Milne's views regarding the absolute efficacy of inunction with antiseptic oils in certain infectious diseases must be received with caution.

Dr. Milne's last illness was mercifully short. A gastric ulcer was found at operation on Monday, November 6th; all went well at first, but haemorrhage from the ulcer commenced, and he sank and died on November 8th. He leaves a widow, five daughters, and three sons; of the latter one is joint medical officer to Dr. Barnardo's Homes, one is surgeon to the London Hospital, and the third is studying medicine.

EDWARD JEPSON, M.D.,

Formerly of Durham.

Dr. Edward Jepson died at Ruislip, Middlesex, after a long illness, on November 13th, aged 73. He was educated at St. Bartholomew's Hospital Medical School, and took the diplomas of M.R.C.S.Eng. and L.S.A. in 1872 and 1874 respectively, and graduated M.D.Durh. in 1839. For forty-two years he practised in Durham and held several appointments. He was honorary surgeon to the County Hospital, medical officer to the Urban District Council, medical officer to the Men and Women's Diocesan Training Colleges. He was Mayor of Durham for two years and a J.P. for the city. He was instrumental in obtaining a higher scale of remuneration for doctors practising in colliery districts. In October, 1905, Dr. Jepson was entertained at dinner by the members of the County of Durham Medical Union and was presented with a roll-top desk and bookcase bearing the following inscription on silver plates: "Presented to Edward Jepson, Esq., M.D., J.P., by the members of the county of Durham in grateful recognition of his arduous and unselfish labour on behalf of the profession in the county and as president of the Union from 1898 to 1905." On the same occasion Mrs. Jepson was presented with a silver tea service. In the amalgamation of the County of Durham Medical Union with the British Medical Association Dr. Jepson took a leading part. He was a member of the Central Ethical Committee of the British Medical Association from 1902 to 1906.

Owing to ill health he left Durham for the south, and after a voyage to India as ship surgeon he was able to take a small practice at Ruislip, which he held until a year before his death. During the war he assisted at Eastcote Red Cross Hospital, and also at Victoria Park Hospital, London. He married Jessie Maria, youngest daughter of George Gilliat of Horncastle, who survives him, and one son and four daughters.

ERIC HASTINGS EASTWOOD, M.B., Ch.B.Liverpool,

Lecturer on Pathology, University of Liverpool.

We regret to record the death on November 13th, at Formby, Lancashire, of Dr. E. H. Eastwood, at the early age of 30. Dr. Eastwood entered Liverpool University from Merchant Taylors' School, Crosby, with a Robert Gee Entrance Scholarship. During his academic career he gained the following distinctions: Senior Lyon Jones Scholarship; University Exhibition in Anatomy and Physiology; Torr Gold Medal for Anatomy; and Holt Medal for Physiology. In March, 1916, he graduated M.B., Ch.B. with honours, and distinction in obstetrics and gynaecology.

During his war service he determined to specialize in pathology, and held in succession the appointment of bacteriologist to the Deccan British War Hospital, Poona; to the North Russian Expeditionary Force (Murmansk), and to the Royal Victoria Hospital, Netley. After demobilization he was appointed Pathologist to the Royal Southern Hospital, Liverpool. He held this post for eighteen months, and was then elected Demonstrator of Pathology in the University of Sheffield. Only three weeks before his death he was appointed Lecturer of Pathology in Professor Ernest Glynn's laboratory at the University of Liverpool.

All those with whom Dr. Eastwood worked unite in paying tribute to his ability, his enthusiasm, and his loyal co-operation. The loss of one whose short life was so full of promise is to be deeply mourned.

THOMAS LYLE, M.D.,

Newcastle-upon-Tyne.

After having recorded his vote on November 15th, at midday, and having called at the office of the Conservative candidate to intimate the fact, Dr. Lyle, who to all appearances seemed to be in his usual health, made his way home-

wards. After luncheon he was found by one of his servants lying on the floor dead. It appears that he had not been feeling quite well, for he had consulted at least two of his friends in the profession.

Dr. Lyle was well known and highly esteemed in Newcastle-upon-Tyne, where he had practised for over thirty years. At the time of his death he was 76 years of age. A native of co. Antrim, he studied at Glasgow University, where he graduated M.B., C.M. in 1870 and M.D. in 1872. In the early years of the practice of his profession he held an appointment in Newcastle City Asylum, subsequently in that of the county of Cheshire, and from 1878 to 1900 he was medical superintendent of the Birmingham City Asylum. The experience of lunacy which he thus gained was of great service to him in Newcastle, where his opinion and advice were frequently sought in cases of mental disease. In this department of medicine Dr. Lyle was regarded as a sound and capable adviser. Quiet and unobtrusive in manner, and without malice or jealousy, he made many friends, with whom he remained on intimate terms to the last. Although a keen Conservative he never thrust his political opinions before people. On November 18th his body was laid to rest in Old Jesmond Cemetery. A Presbyterian, the service at the grave was of the simple order of the Church to which he belonged. Many friends, civil and professional, were present at the cemetery.

In the death of Dr. Charles Edwin Solomon, after a brief illness, Liverpool has been deprived of one of its well-known practitioners. Dr. Solomon, a native of Cornwall, studied medicine at the Liverpool Royal Infirmary School of Medicine, took the diplomas of L.R.C.P. and L.R.C.S. and L.M.Edin. in 1884, and graduated M.D.Durh. in 1905. He settled down immediately after qualification, and through his diligence gained a considerable practice. He was a member of the Liverpool Division of the British Medical Association and of the Liverpool Medical Institution, whose meetings latterly he attended with regularity. He acted as honorary physician to the C.E.T.S. Women's Temperance Home, where his medical services were greatly valued. Dr. Solomon was essentially a sound practitioner, deeming nothing too trivial that would ensure the comfort of his patient. He was a kind man, and his cheery disposition attracted and retained the friendship alike of his professional colleagues and patients. The funeral took place on November 18th, and the number of mourners present showed how highly esteemed and affectionately regarded the late doctor was. Canon Irvine, who conducted the service, pronounced a sincere eulogy on the departed doctor, whom he truly described as a Christian gentleman, a beloved physician, and a trusty friend. Dr. Solomon was a widower, having lost his wife comparatively recently. He leaves behind a grown-up family of two sons and two daughters, to whom we tender our sympathy.

Dr. Myer Akiba Dutch died at Brighton on November 10th at the age of 59. He was born in Dublin and educated at the Wesleyan and Erasmus Smith High School. He commenced his medical studies at the Royal College of Surgeons Medical School, where he won several scholarships in medicine and surgery, and qualified in 1882. He practised for several years at Crewe, Cheshire, and, coming to London, established himself in general practice at Walm Lane, Cricklewood, where he made many friends. In 1904 he obtained the M.D. degree of Durham University, and the F.R.C.S.Edin. in 1908; he had taken the D.P.H. of Cambridge in 1891. During the war he was physician to the Bermondsey Military Hospital, and later he took on the duties of officer in command Tudor House and Beech House Military Hospitals, Brondesbury, his services being specially commended. Dr. Dutch was well known in Masonic circles; he was Past-Master of the St. George Lodge, which he founded, and received many Masonic honours. His body was cremated at Golders Green, and his ashes were buried at Willesden Cemetery. He leaves a widow, two sons, and one daughter.

Dr. Henry Pierce Cuthbert died at Pitlochry, Perthshire, on November 6th, aged 59. He was born at Oswestry, the son of the late Rev. George Cuthbert, and on his mother's side was descended from Simon, Lord Lovat, and from Sir Isaac Newton. He was educated at the London Hospital, and, after taking the M.R.C.S. and L.R.C.P.Lond. in 1889, went into practice at Clun, where he was surgeon to St. Catharine's Hospital and to Trinity Hospital. In 1906 he removed to North Queensferry, Fife, where he was surgeon and agent to the Admiralty and to the coastguard and wireless telegraph station. During the war he took a temporary commission in the R.A.M.C., and served in France and Italy and on troopships.

Deputy Inspector-General Francis Yeates Toms, R.N. (ret.), who died at Hove on November 13th, was probably the senior member of the medical profession in Great Britain, for he had attained the great age of 96. He took the diplomas M.R.C.S. and L.S.A. in 1848, and entered the navy in the following year, attained the rank of fleet surgeon on April 28th, 1872, and retired, with an honorary step as D.I.G., on April 1st, 1881. He served as assistant surgeon on H.M.S. *North Star* in 1852–53 in the Arctic Expedition in search of Sir John Franklin, and received the Arctic medal; and in H.M.S. *Sparrow Hawk* in the China war of 1859–60, taking part in the attack on the Chinese forts and gaining the medal. He was awarded a Greenwich Hospital pension on February 6th, 1890.

Universities and Colleges.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Annual Meeting of Fellows and Members.

The annual meeting of Fellows and Members of the Royal College of Surgeons of England took place on November 16th. Sir Anthony Bowlby (President) took the chair, and placed before the meeting the report of the Council. He indicated the different sections of the report without any particular comment, and called upon Sir John Bland-Sutton to speak of the considerable section dealing with the museum. Sir John Bland-Sutton said that the museum still maintained its pre-eminence. The Council was proud to think that it had been entrusted with what was now known as the Medical War Collection. This numbered altogether some 2,500 specimens, illustrating every phase of injury and disease incidental to the great war. The housing of these specimens had entailed a good deal of structural alteration, but the collection was well worthy of it, not only on account of its size, but because of the interest of the specimens and their careful preservation. Accommodation had also been provided for the Onodi Collection of oto-rhinological specimens, which was now under investigation for the purpose of description and cataloguing. The work would be completed by this time next year.

Dr. Redmond Roche asked the President certain questions with regard to the annual meeting which was summoned last year, and was not held owing to the absence of a quorum. The action of some of the members on that occasion in holding an irregular meeting was the subject of some admonitory remarks in the report. Dr. Roche asked whether it was a fact that members of the Council were in the precincts of the College at the time, but did not make their appearance, as if they had done so a quorum would have been secured; also, whether there was a by-law depriving lady Fellows or Members of the right of voting at the annual meeting. On the last occasion one lady was present, and had it been possible to count her the number would have been the thirty necessary for the quorum.

The President said that the annual meeting was an occasion when Fellows and Members were invited to meet the Council, and as the Council consisted of twenty-four Fellows it was obvious that an attendance of six, apart from the Council, might be sufficient for an annual meeting. This was not desirable, and therefore it was thought well to require the attendance of the thirty apart from members of the Council. Members of the Council were in the precincts of the building on the last occasion. With regard to ladies, the Council was bound by the Act of Parliament under which women were admitted to the College to preclude them from taking part in the management of College affairs.

Dr. Roche then moved a resolution affirming the desirability of admitting Members to direct representation on the Council, and asking for the nomination of at least two Members in general practice. He said that this resolution had been brought forward for twenty years, and had been carried almost invariably by overwhelming majorities, only to be strangled by the Council and buried in the waste-paper basket. No reasons had ever been given for refusing the request of the Members. The government of the College was a mediaeval anachronism, and the constitution of the electorate an unblushing usurpation. The result was a Council consisting exclusively of surgical specialists who had no right to speak for general practitioners, who formed the bulk of the members.

The resolution was supported by Dr. F. G. Lloyd, Dr. Arthur Haydon, Dr. Ware, and others, and on being put to the vote was carried by 26 in favour, and two or three against; the members of the Council did not vote.

Dr. M. I. Finucane moved a further resolution requesting the President to make a detailed statement of the reasons, legal and

otherwise, for the refusal to allow representation of Members in general practice. In these days when the provincial universities were making great headway, and new educational systems were shaping, there was a danger that if the College did not become a more virile institution it might be ignored by the coming medical men. This resolution was supported by Dr. F. W. Collingwood and Dr. Elwin Nash, and agreed to.

The President demurred to the terms of this resolution, which referred to "The Council's refusal to allow representation." That was a misstatement. The Council had power neither to refuse nor to grant. It was strictly limited by its charter, which conveyed no such powers. It was unfortunate also that Members should speak as though there was hostility between themselves and the Fellows: he did not admit that there was any such hostility. In one breath they were told that the status of Members was grievously affected by the action of the Council; in the next, that the status of Members was extremely high. He himself had no hostility to the Members, nor had any member of the Council. Many of the Members were their friends, and many had been their pupils. It was said that this was a matter for which the whole of the Members were pressing. The first resolution spoke of the College as composed of 18,000 persons, of whom 16,000 were engaged in general practice. No indication had ever been given as to how many members there were in the Society of Members; no list of names had ever been published, no figures had been furnished. In the past the Council had consulted the Fellows, who were the electorate, and their opinion on the proposal was adverse. In 1908 the Society of Members asked the opinion of Members of the College, but the result had never been published; it was not known what the result was. Under the circumstances the only way in which the Council could judge of the feeling of the Members was by means of the annual general meeting. There were 18,000 Fellows and Members of the College, and the number of votes cast that day for the main resolution was 26—something like 1.5 per 1,000. He wished to ask the secretary of the Society of Members what was its total membership.

Dr. S. C. Lawrence said that the Society represented the 16,000 Members; he had never himself met a Member who justified the Council's action. Two Members thereupon said that the Society of Members did not represent them.

The President, continuing, said that, in the absence of any more definite figures from the Society of Members, the Council had no information as to the feeling of Members on this subject. He was intimately associated during the war with many hundreds of Members, and this subject was never raised. It was never raised at all except at the annual meeting, when it was often difficult even to get a quorum. He wished also to point out that the present electorate of Fellows was representative. It was constantly suggested that the Fellows were not in general practice; that was a misstatement. Hundreds of Fellows of the College to his own knowledge were in general practice, and every one of them was eligible for a seat on the Council. He was satisfied that the Council represented every part of the profession. In conclusion he read a statement on the subject which the Council had authorized, giving the reasons against an application for an amended charter. The statement recapitulated what the President had already said: (1) The Council believed the present electorate—that is, the Fellows—to be thoroughly representative; large numbers of the Fellows were in general practice or serving in various appointments under the Government or local authorities. (2) The Council was not prepared to advocate measures which were in direct opposition to the opinions of a large number of the present electorate; on two occasions the Fellows had been invited to vote on an extension of the franchise, and the majority of those voting had been against it. (3) There was no evidence of any widespread demand by the Members for the amendment of the charter, and very few Members came to the annual meeting to support it. If any Members were in doubt as to the legal position he asked them to obtain legal advice, and the Council would give full consideration to any legal opinion. The passing of resolutions at that meeting did not give the Council the necessary powers to do what was demanded.

UNIVERSITY OF OXFORD.

AT a congregation held on November 18th the degree of Doctor of Medicine (D.M.) was conferred on A. H. Southam.

The New Schools of Pathology and Pharmacology.

The offer of the trustees of the late Sir William Dunn, referred to in our last issue, was submitted to congregation on November 21st; a delay of a week beyond the date originally fixed having been arranged, in order to allow a fly-sheet of detailed information regarding the proposals to be circulated in the university. The preamble and form of decree printed below were submitted on Tuesday last to one of the largest congregations held within recent years, and were accepted by the House without division. The decree was introduced by Dr. Pember, Warden of All Souls, and supported by the Regius Professor of Medicine (Sir Archibald Garrod), Mr. Arthur Johnson, the President of Magdalen (Sir Herbert Warren), and Professor Poulton.

If and when the offer of Sir William Dunn's trustees has received the consent of the Court of Chancery, the University will be provided with a magnificent "Sir William Dunn School of Pathology," as well as with an excellent School of Pharmacology, in place of the present inadequate provision for the latter subject. Both Professor Dreyer—who is absent in Paris as a British representative at the Serological Congress of the Health Committee of the League of Nations—and Professor Gunn are heartily to be congratulated on the good fortune which has fallen to their departments from the beneficent action of Sir William Dunn's Trustees.

"Whereas Sir William Dunn's Trustees have offered to provide (*a*) the sum of £100,000 for the establishment of a School of Pathology subject to the consent of the Court and to the following conditions (i) that the University provide a site approved by the Trustees, (ii) that the University make permanent provision for the upkeep of a Chair of Pathology and full teaching staff, (iii) that out of the grant a sum of not less than £20,000 be reserved by the University and invested for the provision of a Maintenance Fund for the School of Pathology, and (iv) that the School be known as the "Sir William Dunn School of Pathology," and (*b*) the sum of £3,000 for the adaptation of the existing Department of Pathology as the future School of Pharmacology; the University gratefully accepts these munificent offers of Sir William Dunn's Trustees for the purposes aforesaid and decrees as follows:

"1. That the offer of Sir William Dunn's Trustees of £100,000 for the establishment of a new School of Pathology, and of £3,000 for the adaptation of the existing School of Pathology as the future School of Pharmacology, subject to the conditions laid down by the Trustees, be gratefully accepted, and that the Curators of the University Chest be authorized to receive the aforesaid sums, and to expend them on the above-named purposes.

"2. That a site of approximately 2.3 acres near to South Parks Road be allocated to the new School of Pathology.

"3. That the warmest thanks of the University be conveyed to Sir William Dunn's Trustees for their most munificent offer."

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on November 17th the following medical degrees were conferred:

M.D.—K. B. Aikman, S. D. Kilner.

UNIVERSITY OF LONDON.

AT a meeting of the Senate, held on November 15th, the Vice-Chancellor (Mr. H. J. Waring, M.S., F.R.C.S.) being in the chair, the William Julius Mickle Fellowship of £200 was awarded to Mr. F. J. F. Barrington, M.B., M.S., in respect of the work which he has carried out during the past five years on the nervous mechanism of micturition.

The Council for External Students have elected Dr. E. Graham Little as chairman for 1922-23, and Sir Wilmot Herringham has been elected chairman of the Graham Legacy Committee for the same period.

The following candidates have been approved at the examination indicated:

THIRD M.B., B.S.—†G. L. Brocklehurst, †G. W. Heckels, *R. Hunt Cooke, ‡Sybil G. Mocatta, ‡T. S. North, *Winifred A. M. Thompson, *†R. H. Wade, §Agnes H. White, *†‡ Samson Wright (University Medal), N. D. Ball, J. R. Batten, E. V. Beaumont, J. A. Binning, Mary H. Y. Blakeston, Rosalind Bradley, R. B. Britton, Lorna P. Brown, E. A. Coldrey, Nancy M. Coutts, Idris Davies, A. D. d'Avray, Mary C. Eliot, I. Feldman, Marie L. P. Goetze, Marjorie P. C. Greene, Gertrude E. Harre, Hilda M. Haythornthwaite, Margaret Haywood, J. P. Hosford, D. M. Jones, Dilys M. Jones, W. A. Low, Dora Mason, R. G. Michelmore, Olga M. Naylor, B. S. Nissé, R. J. Parry, F. A. Pickworth, Gladys H. Randall, S. D. Rhind, P. L. Richardson, W. G. Rose, Joan M. Ross, C. H. St. John, Gladys M. Sandes, F. H. Scotson, Olive B. Sharp, B. L. Slater, W. A. M. Smart, Dulcie C. Staveley, Eleanor C. E. Stone, A. J. C. Tingey, F. H. W. Tozer, Lendal Tweed, Harriette B. Woodhouse.

Group I.—Edith I. L. Abbott, K. S. Captain, Grace D. Chambers, Eva D. Cook, S. Crown, G. W. Elkington, R. F. Fagan, E. C. Heap, L. J. M. Laurent, E. A. Leviseur, A. C. Maconie, N. S. Macpherson, Ena M. Sansom, R. O. Swaine.

Group II.—D. A. Blount, Gladys L. Buckley, Helen W. Duncan, Christine P. Francis, F. A. Gaydon, Alice M. F. Goldmann, Kathleen M. D. Harding, Marjorie C. Hawkins, E. G. Housden, G. H. Howells, A. E. Jenkins, B. L. Laver, F. R. Leblanc, Mary Michael, Muriel Rawlinson, Olive M. Salmon, A. H. Shelswell, A. I. Silverman, Emma M. Store, H. G. Stormer, R. S. Swindell.

Distinction in *Medicine, †Surgery, ‡Midwifery, §Forensic Medicine.

UNIVERSITY OF EDINBURGH.

THE following candidates have been approved at the examinations indicated:

FINAL M.D.—*Clinical:* T. F. Andrew, H. C. Brayshaw, J. H. Clarke, D. R. Cramb, B. V. Dunn, J. S. Fulton, W. Goldie, Annie C. Greenep, I. S. Hall, T. Harrison, J. D. Ingram, Frans Krone, Ruth M. Monro, J. O. Murray, G. Ogilvie, Helen M. Russell, B. J. Ryrie, J. Walker, L. H. Werden.

FINAL M.B., CH.B.—*Forensic Medicine:* A. Beveridge, G. P. F. Bowers, F. L. Buttar, V. F. T. Chan, J. G. Cormack, D. A. Cunningham, W. R. Duff, L. M. C. Duthie, E. G. R. Grant, Jeannie Kean, Janet C. King, R. Levinson, Phyllis E. List, J. S. MacGill, J. B. Mackie, Margaret M. Meikle, Ellen A. Morrison, Janet M. Morton, A. S. Nicol, Milorad Petrovitch, Rhoda B. V. Robb, R. T. Sharp, B. Siddons, Cecil Siung, C. R. Smuts, G. H. Thomson, E. J. K. Weeks, J. F. S. Wiseman, E. D. M. Wright, D. H. D. Young. *Public Health:* G. P. F. Bowers, V. F. T. Chan, Elizabeth K. Clark, J. G. Cormack, D. A. Cunningham, N. Fram, E. M. R. Frazer, L. S. Frost, M. N. Gelb, Margaret H. Gordon, E. G. R. Grant, A. B. Guild, L. Jaffit, Janet C. King, Ena M. Laing, R. Levinson, R. V. Liddell, Elizabeth M. Lindsay, Phyllis E. List, Elspeth H. R. Livingstone, F. N. M'Farlane, R. Macfiggans, J. B. Mackie, W. F. Mair, Margaret G. Maxwell, Margaret M. Meikle, E. B. Mercer, H. Miller, R. Morton, C. A. Murray, H. L. Nicholas, A. S. Nicol, J. R. H. Pasqual, Susanne J. Paterson, Milorad Petrovitch, F. N. R. Price, W. H. B. Ramsay, S. J. Reich, J. S. Riddle, Rhoda V. B. Robb, R. T. Sharp, D. A. M. Shearer, C. Siung, Dorothy F. Smith, C. R. Smuts, T. R. Sutherland, D. A. Urquhart, J. F. S. Wiseman, M. A. G. Yoell.

EDINBURGH UNIVERSITY COURT.

At the meeting of the Edinburgh University Court on November 13th, with Principal Sir Alfred Ewing in the chair, Sir David Wallace and Dr. Norman Walker, senior lecturers, were

appointed members of the Faculty of Medicine, and Mr. W. J. Stuart was appointed additional examiner in clinical surgery. Intimation was received from the trustees of the late Emeritus Professor Crum Brown of the bequest of a portion of his library to the University. Dr. R. McKenzie Johnston was elected a Curator of Patronage in room of Sir George Berry, who resigned office. The Court appointed Professor Scott Watson and Dr. Charnock Bradley as their representatives on the joint committee on animal breeding.

UNIVERSITY OF LEEDS.

AT a meeting of the council on November 20th Dr. A. H. Priestley was appointed lecturer in bacteriology. The following appointments to new lectureships in the School of Medicine were approved: Mr. S. W. Daw (Orthopaedic Surgery), Dr. Veale (Diseases of the Skin), Dr. Vining (Diseases of Children).

VICTORIA UNIVERSITY OF MANCHESTER.

DR. H. V. WHITE has been appointed honorary assistant lecturer in physiology.

Medical News.

A LECTURE on the present conditions of small-pox will be given by Dr. Richard J. Reece, C.B. (Senior Medical Officer, Ministry of Health), in the Barnes Hall, 1, Wimpole Street, W.1, on Wednesday, November 29th, at 8.30 p.m. The lecture has been specially arranged by the Fellowship of Medicine in view of the present small-pox outbreak and is open to all members of the profession.

THE following members of the medical profession were called to the Bar on November 17th: G. H. Dart, M.D., M.R.C.P.Edin., Medical Officer of Health for Hackney (Lincoln's Inn); W. W. Jameson, M.D., M.R.C.P., Medical Officer of Health for Finchley (Middle Temple); R. St.G. S. Bond, M.B., F.R.C.S.Edin., M.R.C.P., Surgeon Commander R.N., Director of Medical Studies and Professor of Hygiene, Royal Naval College, Greenwich (Gray's Inn).

THE annual reunion dinner of the Prince of Wales's Hospital and North-East London Post-Graduate College was held at Pagani's Restaurant on November 9th. The chairman, Dr. F. G. Crookshank, remarked on the satisfactory number of members present at this the first dinner after the inauguration of the reunion association. The executive committee had deferred bringing forward a definite constitution, but he hoped it would be possible next year to hold a business meeting to consider plans for the future in relation with the College and the North-East London Clinical Society. He asked members to forward suggestions to the honorary secretaries, Dr. Jenkins Oliver, 1, Devonshire Place, W.1, and Mr. S. O. Rashbrook, 1, Priory Terrace, Kew, Surrey.

THE autumn general meeting of the Irish Medical Schools' and Graduates' Association will be held at Pagani's Restaurant, Great Portland Street, on Thursday, November 30th, at 7 p.m., the President, Dr. J. A. Macdonald, LL.D., in the chair. The meeting will be followed at 7.15 p.m. by the autumn dinner, at which the guest of the Association will be Professor Andrew S. Dixon. Tickets for the dinner, 9s. each, may be obtained from Dr. Humphris, 8, West Chapel Street, S.W.

THE Federation of Medical and Allied Services has arranged a conference on hospital finance, to be held at 12, Stratford Place, W., on Thursday next at 3 p.m. The chair will be taken by Lord Islington. Among those who have notified their intention of taking part in the discussion are Viscount Hambleden, Sir Arthur Stanley, Sir Alan Anderson (honorary secretary, King Edward's Hospital Fund), Sir Napier Burnett (Director of Hospital Services to the Joint Council of the Order of St. John and the British Red Cross Society), Dr. Gordon Dill (Brighton), and Mr. E. W. Morris (house governor of the London Hospital).

THE Glasgow University Club, London, will dine at the Trocadero on Friday, December 1st, at 7.30 p.m. Professor W. P. Ker, LL.D., will be in the chair. Any Glasgow University men who have not received cards and who would like to be present are requested to communicate with the Honorary Secretaries, 1, Harley Place, N.W.1.

THE Henry Jacob Bigelow gold medal has been awarded by the Boston Surgical Society to Dr. W. W. Keen for his contributions to the advancement of surgery. The medal was presented at a meeting of the society on October 25th, the presentation speech being made by Dr. Harvey Cushing.

APPLICATIONS for Government grants for scientific investigations must be received at the offices of the Royal Society not later than January 1st next. Printed forms of application can be obtained from the Clerk to the Government Grant Committee, Royal Society, Burlington House, London, W.1.

THE Harben lectures for 1922 before the Royal Institute of Public Health will be delivered at 37, Russell Square, London, W.C.1, by Professor Theodore Madsen, Director of the State Serum Institute, Copenhagen, on December 1st, 4th, and 5th, at 5 p.m. The first lecture will deal with specific and unspecific antitoxin production, the second with antitoxic treatment, and the third with the influence of temperature on antigen and antibodies.

THE next congress of the Royal Sanitary Institute will be held at Hull from July 30th to August 4th, 1923.

THE Paris, Lyons and Mediterranean Railway, 179, Piccadilly, W.1, announces that from December 1st to April 30th next a through coach, comprising lits-salon and first-class seats, will run between Calais and Hyères. This coach will be attached to the through train Calais-Ventimiglia, now running in connexion with the 11 o'clock service from London (Victoria). Luggage registered through from London to Hyères by this service will be examined by the Customs authorities at destination.

THE late Mr. Bourne, of the firm of Bourne and Hollingsworth, Oxford Street, London, has bequeathed £5,000 to the Lowestoft Hospital for the purpose of providing an operating theatre.

THE meeting of the French Association for the Advancement of Science will be held in 1923 at Bordeaux. Professor Sabrazès has been elected president of the Section of Medicine.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

PLURIGLANDULAR TABLETS.

"STRATFORD" writes: Recently I have been prescribing pluriglandular tablets (thyroid, pituitary, testis) steadily for several patients. On the principle that the tablets supply a glandular insufficiency, they should be taken continuously perhaps for the rest of life. Are there any dangers in such a course?

PSYCHICAL TRAINING.

DR. CHARLES F. FRANCE (Wigan) writes: "F. J." may find the following work useful—*Ambidexterity and Mental Culture*, by Dr. H. Macnaughtón-Jones (Wm. Heinemann, London).

A STRANGE "WILDFOWL."

DR. GEORGE SMITH (Henley-on-Thames) writes: The strange "wildfowl" described by Dr. Frank G. Layton in your issue of November 18th, p. 1004, must almost certainly have been a tick (Ixodes, belonging to the Acaridae, one of the families of the Arachnida). These ticks are rarely found on man. In thirty-five years of a country practice in Oxfordshire I have only seen one case, and it occurred under almost identical circumstances as those mentioned by Dr. Layton. His patient must have caught it from a sheep, horse, ox, or dog.

WARMING THE GARAGE.

DR. T. S. SHELDON (Chester) writes: Last winter I successfully warmed my 16 × 10 wooden garage by a Perfecta oil-stove standing on the concrete floor a few inches from the radiator. My stove burns for seventeen hours without attention. A simple form of hot-water heating is described in *The Autocar* for November 17th.

STIES.

IN reply to the inquiry about sties (p. 953), Dr. Temple Grey (London) writes: Let "M. P." cut down the carbohydrates and give a liberal dose of sodium bicarbonate before the evening meal, avoiding all local interference (such as pulling out an eyelash, bathing, fomentations, patient's fingers, etc.), and the condition will resolve.

LOSS OF HAIR IN SEBORRHOEA.

"M.B., B.S." writes: Having read the recent discussion on seborrhoea, I should like to inquire whether loss and degeneration of hair can be counteracted by (1) "high frequency" treatment, (2) endocrine administration. In a patient under my care—a woman aged 31 years—local treatment and dieting have been carried out over a considerable period. The somewhat greasy seborrhoea, which seems to date from puberty, is mild in degree, but thinning of the hair is marked and progressive.

INCOME TAX.

"W. B. H." inquires whether the cost of medical books and subscriptions can be deducted in assessing a public salary.

*** Our opinion has been frequently expressed; it is that expenditure incurred in keeping professional knowledge up to standard—not in improving it or in building up a medical library—is analogous to that of maintaining professional instruments in proper condition. The words used in the Act are, however, stringent—incurred wholly, exclusively, and necessarily in the performance of the duties of the office—and where the Commissioners take a different view an appeal would be troublesome and expensive.

"HARD HIT" is in general practice, and has been assessed on the three years' average. Owing to a serious illness he has had to hand over his practice to a neighbouring practitioner, who receives half the fees.

*** Our correspondent is liable to pay tax on the average of the three previous years, and has, we regret to say, no right of relief, in spite of the fact that his professional profits are so drastically reduced.

"H. J. C." bought a Saxon two-seater for £82 10s., and sold it in 1920 for £160, buying a Dodge four-seater for £560. In February, 1921, he bought a Hillman two-seater for £560, but sold it a few months later for £350.

*** If "H. J. C." can show that the car for which he paid £82 10s. would have cost more than £160 when he sold it for that amount, the excess can be charged as an expense of the year 1920 The Hillman car transaction is of course unusual: as the Dodge car was not sold, what really happened was that a further outlay of capital was made, and, in fact, lost. Unfortunately, the Income Tax Acts make no allowance for capital losses, but only for the expense of maintaining the capital sunk in equipment, etc. If "H. J. C." should again buy a second car he could claim to deduct so much of that cost as represented the net cost of replacement of the Hillman car, but the purchase and sale of that car have not, *per se*, given rise to any valid legal claim. On equitable grounds there is a fair claim, but that applies in a somewhat different form to every practitioner who sells a car at a loss when he retires, or for any other reason does not replace it.

"A. R." inquires as to the allowance for various car transactions.

*** (*a*) Cost of replacement as effected—that is, £225 less £70 = £155. (*b*) Similar cost—that is, £60 less £20 = £40. (*c*) Cost of replacement of equipment viewed as a whole would be £225 less £90 = £135. It has to be remembered that the actual out of pocket cost is the maximum amount allowable.

LETTERS, NOTES, ETC

INTRAUTERINE DECAPITATION?

DR. J. D. POLE (Mexborough, Yorks) writes: On the afternoon of November 6th I was urgently called to attend Mrs. J., aged 22, who had been married two and a half years. She said that she gave birth to a child a year ago, which died at 8 months from "consumptive bowels." Since last July menstruation had been irregular, and she had had menorrhagia for several months (periods three-weekly), but latterly practically amenorrhoea. She said she had been assured by a doctor a month ago that she was not pregnant. Pain in right lower abdomen had occasionally troubled her. On November 5th she had a fall, her lower abdomen striking a piece of furniture. About midday on November 6th she felt a desire to defaecate, and a foetus *minus* the head was ejected, accompanied by a fair amount of haemorrhage. Downbearing pains followed and continued. I estimated the decapitated foetus shown me as four to five months, and there was 8 to 10 inches of cord attached; the neck and end of cord gave appearance of being wrenched or twisted off; the right leg was bruised. A rounded firm mass could be felt through the os and in the anterior fornix fairly high up. No laceration of vaginal walls was obvious. The uterus was palpable two finger-breadths above the symphysis and firm. Ergot was given, and shortly afterwards the head and membranes were passed with fairly profuse haemorrhage. When seen next day the uterus was no longer palpable; the patient has since felt comfortable, and discharge is slight. I have been puzzled to account for the injury to the foetus. If from the fall, there would surely have been much more evidence of abdominal injury and general shock. If from natural expulsive power, the strength to break through the attachments of foetal head to trunk is greater than what I have hitherto known the uterus to be credited with. The possibility of interference occurred to me, but this was negatived.

*** It seems rather unlikely that the abdominal traumatism on the preceding day was the cause of the decapitation of the foetus expelled by Dr. Pole's patient. Since Dr. Pole was not present when the body of the foetus was born it is conceivable that the woman, consciously or unconsciously, may have pulled upon the foetal trunk and so separated it from the head. Such a separation does not require a large amount of force in the case of a four months' foetus; but this possibility could have been judged better if the weight and length had been given. It is, of course, undoubted that injuries of a marked sort when applied to the mother's abdomen in pregnancy, and more especially in the absence of the usual amount of liquor amnii, may cause fractures and dislocations in the foetus—Ballantyne in his *Antenatal Pathology*, vol. i, The Foetus, pp. 48, 393; and vol. ii, The Embryo, p. 139, records cases—but commonly there is abnormal fragility of the skeleton in such cases, and these injuries are very different in degree from separation of the head from the body. The "spontaneous amputations in the foetus" described so fully by Sir James Y. Simpson are probably due either to amniotic bands or to some skin lesion; but in one or two of the instances which he reported an abdominal injury to the mother was the alleged cause. The limbs were the amputated parts in Sir James Simpson's cases, not the neck.

APPARENT ABSENCE OF TUMOUR IN CASE OF INTUSSUSCEPTION.

DR. B. S. HOLLICK (Sturminster Newton) writes: In the case of intussusception reported by Drs. Herbert and Norbury (November 11th, p. 922) it is interesting to note the observation that no tumour could be felt through the abdominal wall under the anaesthetic, in the light of a similar case which I saw recently with my partner—Dr. Watts-Silvester—who suspected an intussusception in a baby in whom the symptoms were by no means definite. No tumour could be felt, but as it was difficult to form an accurate diagnosis and the baby very difficult to examine, a little chloroform was administered, after which a distinct tumour could be felt in the right hypochondrium. The child was admitted to a nursing home for laparotomy about two hours afterwards, and on examining the abdomen under complete anaesthesia no tumour could be felt by ordinary palpation, but one became manifest only when examining bimanually (that is, with one hand behind the right lumbar region). The abdomen was then opened and an intussusception found, involving the ileo-caecum and extending to the transverse colon, and it was reduced. Complete recovery followed. There are two points about this case which induced me to record it: (1) The importance of giving chloroform in a doubtful case of acute abdomen in a small child to facilitate examination; (2) the importance of bimanual examination in addition to the ordinary palpation of the abdominal viscera.

"BAD ARMS" AFTER VACCINATION.

"R. N. M." writes to point out the value of the treatment of bad arms from vaccination by painting the marks and surrounding skin once daily with an application containing equal parts of glycerin and liquor ferri perchloridi (not the tincture). Means should be taken to prevent staining of the underclothes, otherwise a permanent rusty mark will be left on them.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 33, 34, and 35 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32 and 33.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *199*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£ s. d.
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Whole single column (three columns to page) ...	7 10 0
Half single column	3 15 0
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Whole page	20 0 0

An average line contains six words.

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